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READING ACHIEVEMENTS OF FIRST GRADE BOYS VERSUS FIRST GRADE GIRLS USING TWO APPROACHES--A LINGUISTIC APPROACH AND A BASAL READER APPROACH WITH BOYS AND GIRLS GROUPED SEPARATELY.

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SEX DIFFERENCES IN READING ACHIEVEMENT RESULTING FROM USE OF TWO DIFFERENT APPROACHES TO TEACHING READING IN THE FIRST GRADE WERE STUDIED. A STANDARD BASAL READER APPROACH WAS USED WITH READING GROUPS DIVIDED BY SEX AS WELL AS ABILITY. PACE AND EMPHASIS OF INSTRUCTION FOR THE BOYS WAS ADAPTED TO SUIT THEIR NEEDS. A LINGUISTIC APPROACH ORGANIZED TO SUIT THE APTITUDES OF BOYS FOR TRANSFER AND INDUCTIVE REASONING WAS USED WITH GROUPS DIVIDED BY ABILITY ONLY. EACH OF THE TWO EXPERIMENTAL GROUPS AND THE CONTROL GROUP CONSISTED OF 10 FIRST-GRADE CLASSES, GIVING A TOTAL SAMPLE OF 633 SUBJECTS. AT THE CLOSE OF A 140-DAY INSTRUCTIONAL PERIOD, ACHIEVEMENT TESTS WERE GIVEN. FOR WORD READING SKILL, THE BOYS IN BOTH EXPERIMENTAL GROUPS EXCELLED THE CONTROL GROUP, AND THE LINGUISTIC METHOD PROVED SUPERIOR TO THE BASAL READER APPROACH. GIRLS IN ALL THREE GROUPS HAD SIGNIFICANTLY HIGHER MEANS THAN THE BOYS IN THE SAME GROUP ONLY ON THE TEST OF PARAGRAPH MEANING. ON NEARLY EVERY MEASURE OF ACHIEVEMENT, THE LINGUISTIC APPROACH SEEMED THE MORE EFFECTIVE. SEX GROUPING WAS SLIGHTLY ADVANTAGEOUS FOR BOYS BUT APPEARED DETRIMENTAL TO GIRLS. (AL)

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Reading Achievements of First Grade Boys Versus First Grade Girls Using Two Approaches: A Linguistic Approach and a Basal Reader Approach with Boys and Girls Grouped Separately.

Cooperative Research Project No. 2735

Nita M. Wyatt

1965

The University of Kansas
Lawrence, Kansas

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CHAPTER I

SEX DIFFERENCES IN READING ACHIEVEMENT

Reading has long been considered a basic school subject in the sense that progress in other subjects is dependent upon reading ability. The learning problems which cause many children to drop out of school as soon as they may legally do so can often be related to failure to learn to read during the early years in school. Hundreds of research studies have been devoted to finding ways of improving reading instruction and of reducing the incidence of reading failure. Very few of these studies, however, have been concerned with studying sex differences in reading achievement even though there is a far higher incidence of reading failure among boys than there is among girls.

Not only do boys fail more often in reading than do girls, but reading achievement for boys in general lags behind that of girls. Despite this fact, schools continue to function as sex-neutral institutions. Although we use the same procedures in teaching both boys and girls, there is evidence that modes of learning may differ for boys and girls. On intelligence tests girls usually do better on verbal items and on rote memory, while boys do better on tests of inductive reasoning and arithmetical ability. Boys seem to have greater ability to transfer knowledge from one situation to another.

There is a possibility that heavy emphasis upon the word method of teaching in initial reading instruction may favor girls. Girls may be more likely than boys to learn each new word as a separate item and to remember it, whereas boys may be more likely to profit from a method of instruction which depends upon logic and reasoning. This line of thinking leads to the hypothesis that a different method of instruction than that commonly used might produce greater achievement in reading on the part of boys.

Something other than teaching methods may, however, account for the differences between boys and girls in reading achievement. Several somewhat related hypothesis exist in the literature on the subject. They include these:

1. Boys and girls mature at different rates and some phases of growth are closely related to reading.
2. The school environment at the primary level is more frustrating to boys than to girls.
3. Basal reader materials are less motivating and less satisfying to boys than to girls.
4. Boys are less motivated to read because they identify reading as a feminine activity.
5. Most primary teachers are women who tend, as a group, to be more punitive toward boys than they are toward girls. The punitive attitude may be the result of more aggressive behavior on the part of boys than on the part of girls.

Several types of adaptations of the typical school arrangement have been proposed as ways of compensating for factors which seem to penalize boys. Such proposals include those of delaying school entry for boys, providing male teachers for first grades, and grouping children so that only girls are placed in one classroom while only boys are placed in another. The aim of the present study was to arrange some less radical modifications in procedure which might produce greater achievement on the part of boys in first grade reading. The purpose was to test two different approaches to reading instruction which could be carried out in the existing school framework.

One treatment involved an approach using grouping for reading instruction by sex as well as by ability. Boys were taught in reading groups composed of boys only so that the pace and emphasis of instruction could be adapted to suit their needs. Girls were also taught in sex-segregated groups. Both boys and girls continued to use the familiar basal reader.

The second treatment involved the use of materials based on a linguistic approach to reading instruction. The materials presented a sequential introduction to spelling patterns in which boys could utilize their greater aptitude for transfer and inductive reasoning if they did, indeed, possess such an advantage. The materials and methods stressed comprehension and fluency as well as word analysis skills. Boys and girls were taught together in groups based on ability only.

The objective of the study was to test the following hypotheses: (1) that boys will make higher scores on measures of reading achievement if they are introduced to reading through materials in which there is one sound to one letter than they will if they are introduced to reading through materials in which sound-symbol relationships are ignored; (2) that boys will make higher scores on measures of reading achievement if they are grouped by sex for instruction and the rate and emphasis of instruction are adapted to their needs than they will if they are grouped by ability only with no attention given to sex differences; (3) that girls will make higher scores on measures of reading achievement under each of the approaches to be studied than will boys.

CHAPTER II

REVIEW OF RESEARCH

Research reports indicate that boys as a group lag behind girls as a group in reading achievement in the early years of school. There is also evidence to indicate that as they mature, boys as a group tend to catch up with girls in achievement. However, not all boys overcome initial failures in learning to read. From 75 to 90 per cent of children referred to remedial reading clinics for special treatment are boys.

Gates[1] studied sex differences in reading ability of 13,114 subjects in grades two through eight. In 21 comparisons the scores for girls were higher than those of the boys and the differences were significant. Gates concluded that on the average, girls' reading abilities exceeded those of boys. He commented that maturity did not explain the superiority because, in his study, the girls were superior in the upper grades as well as in the lower ones. Environmental rather than hereditary factors were suggested as causes for the differences in achievement.

Pauley[2] found that as a group the boys among 1500 second grade pupils were two months older chronologically than the girls, but their mean reading achievement was two months below that of the girls.

In 1942, Stroud and Lindquist[3] reported on the achievements of 50,000 students in over 300 schools. The data compiled covered a number of years of testing in the Iowa schools, using the Iowa Every Pupil Test of Basic Skills. The following table shows the mean differences in reading comprehension scores between boys and girls for grades three through eight.

---

[1] Gates, Arthur I. "Sex Differences in Reading Ability." Elementary School Journal, 61 (May, 1961) 431-434.

[2] Pauley, Frank R. "Sex Differences and Legal School Entrance Age." Journal of Educational Research, 45 (September, 1951) 1-9.

[3] Stroud, J. B. and Lindquist, E. F. "Sex Differences in Achievement in the Elementary and Secondary Schools." Journal of Educational Psychology, 33 (December, 1942) 657-67.

TABLE 1

COMPARISON OF READING ACHIEVEMENT SCORES FOR BOYS AND GIRLS

Grade	Mean Differences (all favoring girls)	Significance Ratios
3	2.12	2.57
4	2.75	3.38
5	1.29	1.77
6	.30	.39
7	.10	.14
8	.47	.50

Prescott[4] studied sex differences in the performances of beginning first-grade pupils on the Metropolitan Readiness Test. Since the boys were found to be significantly older than the girls, they were matched for chronological age. The girls were found to have the higher mean score on the readiness test with the difference in the means being significant at the five per cent level of confidence.

Heilman[5] reported the following data from a number of studies showing the percentages of boys and girls referred as remedial reading cases:

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[4] Prescott, George A. "Sex Differences in Metropolitan Readiness Test Results." Journal of Educational Research, 48 (April, 1955) 605-10.

[5] Heilman, Arthur W. Teaching Reading. Charles E. Merrill Books, Columbus, Ohio, 1961, p. 356.

TABLE 2

PER CENT OF BOYS AND GIRLS REFERRED AS REMEDIAL READING CASES

Study	Year Published	Number of Cases		Per Cent	
		Boys	Girls	Boys	Girls
Blanchard	1936	63	10	86	14
Young	1938	37	4	90	10
Preston	1940	72	28	72	28
Missildine	1946	25	5	83	17
McCollum & Shapiro	1947	31	9	76	24
Axline	1947	28	9	76	24
Vorhaus	1952	178	47	80	20
Johnson	1955	23	11	67	33
Fry	1959	163	39	81	19

The studies cited above are representative of many which report sex differences in achievement in reading. One of the reasons advanced for the apparent advantage of girls is that females show a marked superiority in language usage in general. Although Templin[6] did not find as great a difference as other investigators, she reported that girls were superior in articulation and sound discrimination at the age of eight while boys were superior in vocabulary at the ages of six to eight. Few significant differences were apparent between boys and girls at the ages of three through five years. Waetjen and Grambs[7] suggested that schools reward verbal comprehension and language skill, and, consequently, reinforce the greater facility with language which girls possess when they come to school.

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[6] Templin, Mildred C. Certain Language Skills in Children. University of Minnesota Press, Minneapolis, 1957, pp. 145-46.

[7] Waetjen, Walter B. and Grambs, Jean D. "Sex Differences: A Case of Educational Evasion?" Teachers College Record, 65 (December, 1963) 261-71.

Boys have been shown to be less mature physically than are girls at the age of six.[8] The relative physical immaturity of boys may make the school environment a more frustrating one for them than it is for girls since the typical school environment requires some curtailment of physical activity. The difference in metabolic rate between boys and girls is also highly significant.[9] Even though the male matures later than the female, his oxygen intake is greater and his energy output is greater. This greater energy output may cause the school environment to be more restrictive and frustrating for boys than it is for girls.

Some investigators have produced evidence that cultural factors are related to the lag in reading achievement on the part of boys. Mazurkiewicz reported that ". . . in the population studied, members of the male sex generally view reading as a mostly feminine activity and that this attitude seemingly exerts some influence on a boy's reading ability."[10] Preston[11] compared the reading achievement of German and American children at the fourth and sixth grade levels and found that the achievement of American girls exceeded that of American boys, while the reverse was true among German children. He also found a higher incidence of reading retardation among boys in America than among girls, but, again, the reverse was true in Germany. He commented that the apparent superiority of German boys to

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[8] Terman, L. M. and Tyler, Leona A. "Psychological Sex Differences." Manual of Child Psychology. Edited by L. Carmichael. Wiley, New York, 1954

[9] Scheinfeld, Amram. Women and Men. Harcourt Brace & Co, New York, 1944, p. 48.

[10] Mazurkiewicz, Albert J. "Social-Cultural Influences and Reading." Journal of Developmental Reading, 3 (Summer, 1960) 254-263.

[11] Preston, Ralph C. "Reading Achievement of German and American Children." School and Society, 90 (October, 1962) 350-354.

German girls could be due to elements in the German culture which identify reading and learning as normal activities of the male. One of these cultural factors was thought to be the predominance of male teachers in Germany, even in the elementary school.

Not only are teachers of first grade in this country nearly always women, but there is also some evidence that these teachers treat the sexes differently and that there is some association between teacher behavior and performance in beginning reading. McNeil[12] found that boys were superior to girls on a test of word recognition administered after a three week period of programmed instruction in kindergarten. After four months of instruction in first grade with female teachers, these same boys achieved less well than the girls. Interview and questionnaire procedures used with both the children and the teachers indicated that the teachers did not adjust their procedures to the behavior tendencies of boys as well as they did to the behavior tendencies of girls. Boys received more negative comments during reading sessions than did girls and they were given fewer opportunities to read.

Although schools use the same procedures in teaching both boys and girls, there is evidence that modes of learning may differ for the sexes. Kostick[13] found that high school boys had superior scores on tests of transfer of learning which could not be attributed to intelligence, previous knowledge, reading comprehension, reading preference, personal traits, or practice effects. Vernon[14] found that on intelligence tests girls do better on most verbal items and on rote memory, while boys do better on tests of inductive reasoning and arithmetical ability.

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[12] McNeil, John D. "Programmed Instruction Versus Usual Classroom Procedures in Teaching Boys to Read." American Educational Research Journal, 1 (March,1964) 113-19.

[13] Kostick, Max M. "A Study of Transfer: Sex Differences in the Reasoning Process." Journal of Educational Psychology, 45 (December 1954) 449-458.

The story content of basal readers may be more appealing to girls than to boys. The stories in beginning reading textbooks have typically been stories about home and family life. Research reports indicate, however, that young boys have greater interest in other topics. Rogers and Robinson[15] reported the following general interests and concerns of young boys, listed in order of importance:

1. Adventure - airplane rides, astronauts, cave exploration
2. History
3. Make-believe
4. Happiness
5. Humor
6. Today's world
7. Anxiety
8. Family

Byers[16] listed interests in order of frequency as follows: (1) science and nature, (2) possessions: cars, trucks, yo-yos, balls, boy animals, things that run; (3) personal experiences: accidents, mishaps around the house, adventure; (4) family and home activities, especially masculine activities; (5) outdoor recreation: fishing, swimming, sports, bicycle riding, camping; (6) clothing: shoes, shirts; (7) events concerning friends and community; and (8) movies, television and music.

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[14] Vernon, P. E. Intelligence and Attainment Tests. University of London Press, London, 1960.

[15] Rogers, Helen and Robinson, H. Alan. "Reading Interests of First Graders." Elementary English, 40 (November 1963) 707-11.

[16] Byers, Loretta. "Pupils' Interests and the Content of Primary Reading Texts." The Reading Teacher, 17 (January, 1964) 227-233.

Witty[17] found that the interests of boys centered about vigorous games, construction projects, animals and books about animals, space, pilots, children at home, and children in other lands. Vocational choices of first grade boys included those of policeman, doctor, pilot, baseball player, scientist, and fireman. Boys wished for bicycles, trains, horses, dogs, and money. They were afraid of snakes, dogs, the dark, fire, and wild animals and they wondered about outer space, God, and Santa Claus.

Smith[18] studied the reading choices children made from basal readers when they were given free choice. Topic choices in pre-primers and primers were: (1) children - parents, (2) real animals, (3) toys, (4) play-games, and (5) humor-fantasy. Choices from first readers were: (1) humor-fantasy, (2) real animals, (3) nature-science, (4) holidays-birthdays, and (5) fairy tales.

These summaries of the interests of young boys, along with the other studies reported in this chapter, were used in divising the procedures to be followed in the present study. A detailed account of these procedures is presented in the following chapter.

---

[17] Witty, Paul. "Pupil Interests in the Elementary Grades." Education , 83 (April, 1963) 451-462.

[18] Smith, Ruth C. "Children's Reading Choices and Basic Reader Content." Elementary English, 39 (March, 1962) 202-209.

CHAPTER III

PROCEDURE

Introduction

In 1964, 27 research centers were established through grants from the U. S. Office of Education for the purpose of conducting co-operative research in first grade reading during the 1964-65 school year. The present project was one of the 27 studies. The projects were co-ordinated in that some procedures were cooperatively planned by the 27 project directors and by staff members from the co-ordinating center at the University of Minnesota. The procedures to be described below, are, therefore, in some cases procedures adopted by the project directors for all projects, and in some cases are procedures unique to the present study.

Selection of the Sample

One of the decisions of the project planning board was that no treatment group should be composed of less than 10 first grade classrooms. In the present study two experimental groups and one control group were to be established, so 30 first grade classrooms were needed to constitute the research center. Subjects were drawn from three elementary school districts in order to meet this requirement. The project director first contacted the elementary school supervisor most directly responsible for first grade reading in each of the districts. Together the project director and each supervisor considered the roster of first grade teachers in the district. Those teachers who were known to be competent in their jobs and who had taught in the district at least one year prior to the 1964-65 school year were listed for consideration.

In District A, the supervisor talked with each qualified teacher individually and was able to find nine teachers who were willing to participate in the experiment. In District B, a letter of explanation about the project and a checksheet were sent from the supervisor's office to each qualified first-grade teacher in the district. The checksheet allowed each teacher to indicate one of four preferences: (1) participation in the linguistic experimental group, (2) participation in the sex-grouping, or boy-girl, experimental group, (3) participation in the control group, or (4) no participation in the project. Using these checksheets as a starting point, the supervisor contacted the teachers by phone and found 15 teachers who were willing to participate in the project. In District C, six qualified teachers were contacted by phone by their supervisor and asked whether they would like to participate. After some discussion with the director of the project about the methods to be used in teaching the experimental groups, all six teachers accepted the invitation. Although no coercion was applied to teachers to get them to become a part of the experiment, a few were not eager to participate, but did so only because they recognized that the supervisors were having some difficulty in securing the number of teachers needed.

Through conferences with the supervisor and the teachers, it was possible to constitute the treatment groups in such a way that the groups were roughly equated on a number of factors. Teachers from each of the three districts were equally distributed across the three treatment groups. Each treatment group was composed of three teachers from District A, five from District B, and two from District C, for a total of 10 classes. This meant that each treatment group was made up of eight classes from the upper socio-economic level of the population, one from the lower level, and one from a mixed population.

It was possible, also, in securing teachers, to contact those who were needed to equate the treatment groups on the factor of teacher experience. Whenever a second-year teacher was secured for one treatment group, an attempt was made to find one teacher for each of the other two groups who was also a second-year teacher. A thirty-year teacher in the control group was matched by a thirty-year teacher in each of the two experimental groups.

The chronological age of the children in each treatment group was another factor which was roughly equated as the groups were being formed. In 18 of the 30 classrooms included in the experiment children were assigned to classrooms through a random procedure, so it was assumed that chronological age could be equated by distributing these classes so that six fell into each treatment group. In the schools housing the other 12 classrooms, children were assigned to classes on the basis of chronological age. Therefore, teachers assigned to work with the youngest children were distributed across the three treatment groups, as were those assigned to work with each of the other age level divisions.

Three restrictions were placed upon the 30 classrooms selected for participation in the project. The first was that no student teachers or observers were to be placed with teachers in any of the classrooms. The second was that no new students transferring into the system after the beginning of the instructional period were to be assigned to either of the experimental groups. Teachers in each of the experimental groups were to be assigned a larger number of students at the beginning of the year than were other first grade teachers in the building, so that the other rooms could absorb all new students. The third restriction was that no more than 30 children were to be placed in any of the experimental or control classrooms as an initial enrollment.

In some buildings, teachers working in each of the three treatment groups taught in adjacent rooms. They could not avoid contact with one another, but they were asked to refrain from discussing with one another the teaching methods and the materials they were using. After the instructional period was completed, free discussion among the teachers was encouraged.

Description of the Sample

The selection procedures described above produced a sample having the following characteristics:

1. At the beginning of the instructional period there were 702 children enrolled in the 30 classrooms, with an average class size of 23. Class size ranged from 17 through 30 for the total group with a range in the boy-girl group from 19 to 30, in the linguistic group from 19 to 29, and in the control group from 17 to 29.
2. Of the 702 children, 673 were white children while 29 came from other ethnic groups. These 29 children were distributed among the three treatment groups.
3. All the children lived in urban areas. Seventy per cent of the children lived in newly-developed suburban areas, while 30 per cent lived in a small city with a population of about 30,000 people.
4. The median number of years of education of the adults living in the suburban areas from which 70 per cent of the sample was drawn was 12 years. This figure was obtained from the census bureau listing for census tracts in which the school buildings were located. The median number of years of education of adults in the small city from which 30 per cent of the sample was drawn was 13 years. However, figures for census tracts in which the school buildings themselves were located were not available, and the figure reported above was a median for the entire city. Since a university was located in the city, the median reflected a general level of education which was not characteristic of each segment of the adult population. Observation led to the conclusion that the average education of the populace served by three of the schools involved in the experiment was much lower than the city median of 13 years.
5. The median income of adults living in the suburban areas from which the sample was drawn was about $7000 per year. The average income for adults in the small city was $5000 to $6000, but again this figure obscured the true median income for some underprivileged groups whose children were involved in the study.
6. The length of the school year for all the children in the study was approximately 180 days. The school day was six hours long for the children in District A and five hours long in the other two districts.

7. In both Districts A and B there were 12 elementary school buildings, each of which housed more than one first grade class. Some of the buildings housed as many as six first grade classes. In District C there were three elementary school buildings each housing two or more first grade classes.

8. At least seven of the classes assigned to each treatment group had available to them services of librarians housed in their own buildings. Seven of the 30 classes did not have the services of a librarian available to them.

9. The per pupil cost of educating the children in Districts A and B was between $400 and $500 while the cost in District C was between $500 and $600.

10. All of the 30 teachers involved in the experiment were female, and all were married with the exception of one in the control group and two in the linguistic group.

11. The average age of the teachers in the linguistic group was 39 years while the average teacher age in the other two groups was 38 years. The range in age for the total group was from 22 years to 59 years.

12. All of the teachers except one in the boy-girl group had earned at least a bachelor's degree. Four of the 30 teachers held master's degrees. All of the teachers held the standard elementary certificate issued by the state with the exception of three teachers in the boy-girl group who held provisional certificates.

13. All of the teachers had taught first grade at least one year prior to the 1964-65 school year. The teachers in the linguistic group had taught first grade an average of 9.6 years. The average in the boy-girl group was 8.3 years and the control group average was 6.4 years.

In summary, 90 per cent of the children who made up the sample came from upper or middle class families in which at least a high school education was normal for both parents. They attended modern, well-equipped schools where they were taught by well-qualified and experienced teachers who were able to give them individual attention because the pupil-teacher load was small. About 10 per cent of the children came from lower income families in which not all the parents had graduated from high school. Although the home environment of some of these children might have been called sub-standard, the school environment provided for them was not.

Teaching Method and Materials Used in the Sex-Grouping Approach

There were three assumptions underlying the sex-segregated method of teaching. They were:

1. That girls learn to read more quickly and more efficiently than boys do, but that boys are capable of matching the achievement of girls.
2. That teachers do not adjust their procedures to the behavioral tendencies of boys as well as they do to the behavioral tendencies of girls.
3. That teachers can learn to utilize the behavioral chacteristics of boys in teaching reading in the first-grade.

The first objective in this approach was to acquaint the teachers with the possibility that they might need to approach boys and girls differently in teaching reading. A list of summary statements derived from research reports was compiled for consideration by the teachers. The list contained the following statements:

1. The skeletal development of girls is greater than that of boys at the age of six.
2. Boys need to take in more fuel than girls; they also produce more energy.
3. The intelligence of boys varies more than that of girls; girls tend to cluster around the mean.
4. Girls see themselves as more accepted and valued than do boys.
5. Girls sense what the teacher wants more quickly than boys and give it to her, thus getting rewards of praise and good grades.
6. Aggressive behavior on the part of boys is more accepted and valued by society than aggressive behavior on the part of the girls.
7. Teachers assign higher school marks to girls than to boys, even when the intelligence of both groups is equal.
8. Girls are interested in face-to-face social relationships while boys are more interested in activity and exploration.

9. Boys possess a somewhat greater familiarity with the world than do girls; girls react to the world more emotionally.

10. Boys possess superior ability in transferring skills or knowledge to a new situation.

11. Boys are more likely than girls to see broad relationships among content areas.

12. Girls do better on rote memory than boys; boys do better on inductive reasoning.

13. Girls achieve higher scores in language areas on standardized tests, while boys do better on abstract reasoning and numerical ability.

14. Boys take about one year longer to reach maturity in the articulation of speech sounds than do girls.

15. At the age of eight the mean score of boys on sound discrimination is about equal to that of girls one year younger.

It was emphasized in discussions with the teachers that these statements were broad generalizations which applied to large groups of children but which might not apply to an individual.

The guides to method which were developed for use in the experiment were developed primarily to influence the attitudes and activities of the teachers in dealing with boys during the reading periods. Six of the guidelines were designed to insure that boys received "equal time" in reading groups; that they were given adequate praise or reward for accomplishments; that they were helped to feel that reading was a masculine activity with which they could readily identify; and that each boy was made to feel that he was capable of learning to read. The six guides to method were:

1. Boys and girls should be grouped separately for instruction in reading. Other language arts may be taught to the whole group or to mixed groups. If possible, a corner of the room should be arranged for boys' reading groups and another corner for girls' reading groups.

2. No comparisons of progress should be made between boys' groups and girls' groups. In order to avoid having the children themselves make comparisons, the basal and supplementary reading materials used in the boys' groups should be different from those used in the girls' groups.

3. Reading materials suited to the interests of boys and those suited to the interests of girls should be provided for the different groups. Selection of stories to be read in the basal and supplementary readers should be based on interests as much as possible rather than on the order of presentation of the stories within the book.

4. Attempts should be made to make reading as masculine as possible for the boys. Boys should be helped to identify with the masculine roles in their reading materials. If stories are dramatized in the groups, boys should not be asked to assume feminine roles.

5. In developing lesson plans, the teacher should structure questions about the story to be read so that the importance of the boy character or characters is stressed. The same should be true of girl characters about whom the girls are reading.

6. Trade books may be a part of the reading program from the beginning of the instructional period. In reading aloud to the children, the teacher should choose books which will appeal to both sexes as often as possible.

Four additional guidelines were listed to help the teachers recognize and utilize differences in the behavioral patterns of boys and girls. The statements were:

7. Boys have a higher energy output and less highly developed control over the body than girls. Their need for activity and movement may be greater than that of girls. Boys should be given opportunities to move about frequently. Manipulative materials used in games which require boys to move about may be used in reading group sessions.

8. Several short sessions of work should be better for boys than one long period. The type of activity should be changed about every 10 to 15 minutes for boys. Care should be taken to avoid having boys work for long periods of time at independent seatwork without some kind of break or change of pace. Girls may work for longer periods of time without reaching a frustration point.

9. An interest on the part of boys in exploring their surroundings may be utilized by teaching meanings for words through the use of concrete objects. Girls may respond adequately to the use of pictures and verbal definitions.

10. More attention to sound discrimination may be needed on the part of boys than will be needed by girls.

Summaries from research reports on the interests of first-grade boys were used by the teachers and the research staff in selecting materials to be used with the boys' groups. Trade books which contained stories about subjects of interest to boys were purchased and placed in each of the 10 classrooms. Forty-seven such books were placed in each classroom, where they were read by both boys and girls. (See Appendix A.) The cost of these 47 trade books was approximately $88.00 per classroom. Additional trade books of interest to both boys and girls were obtained from school libraries for use in the experimental classrooms.

The basal reading materials published by Houghton-Mifflin and by Ginn were designated as the textbooks to be used with boys' groups. The Houghton-Mifflin series was to be used as the basal for the high ability groups, but either Houghton-Mifflin or Ginn could be used with the slow-learning boys. The Scott, Foresman _New Basic Readers_ were used as the basal materials for girls. Either Winston, Row Peterson, Laidlaw, or Lyons and Carnahan reading texts were used as supplementary or co-basal materials by the girls.

The assignment of basal textbooks to boys or to girls was done on a somewhat arbitrary basis, since story content did not differ enough from one series to another to make the assignments on the basis of reading interests. Supplementary readers from three companies did, however, seem to contain stories which would appeal to the reading interests of boys. Ten copies of each of the following supplementary readers were purchased for each classroom at a cost of $86.00 per class. The books were to be used with boys' groups only.

> Adda Mai Sharp and Epsie Young. _Secret Places_. The Steck Company, Austin, Texas, 1955. (Pre-primer).
>
> Adda Mai Sharp and Epsie Young. _Every Day a Surprise_. The Steck Company, Austin, Texas, 1956. (Primer).
>
> Adda Mai Sharp and Epsie Young. _Did You Ever?_ The Steck Company, Austin, Texas, 1957. (First Reader).

Marjorie Pratt and Mary Meighen. Story Wagon. The L. W. Singer Company, Syracuse, New York, 1965. (Primer).

Marjorie Pratt and Mary Meighen. Story Time. The L. W. Singer Company, Syracuse, New York, 1965. (First Reader).

Leland B. Jacobs and Jo Jasper Turner. Merry-Go-Round. Charles E. Merrill Books, Inc., Columbus, Ohio, 1960. (First Reader).

Although different materials were used with the boys' and girls' groups at the pre-primer level and all subsequent levels, the readiness materials were the same for all groups. Since it was thought that the concentrated attention to learning letter names and sounds introduced in the Houghton-Mifflin series at the readiness level might influence achievement at the end of the instructional period, these materials were made available for use with all reading groups in the 10 classes in this experimental group. Each teacher had 30 copies of Getting Ready to Read and 30 copies of Learning Letter Sounds. In addition, each teacher was supplied with the teaching materials which accompanied the readiness books: one set of object boxes, one set of miniature plastic objects, one set of Picture Key Cards, and one set of Letto Cards.

Workbooks to accompany each book through the primer level were provided for each of the basal series being used in the 10 classes. If they were not already available, word introduction charts, duplicating masters, and word cards to accompany the basal texts were also purchased for each classroom. In addition, each teacher spent about $20.00 for games and devices to be used primarily with groups of boys, but also with girls when they were appropriate. See Appendix A for a complete listing of all materials used.

The total cost of teaching materials used in this approach was $1,921.70, or $192.17 per classroom. This figure was not a true picture of the cost of the materials, however, for District B provided the additional basal reading texts which were needed for the five classes in that district. The cost per classroom would have been approximately $350.00 if all the materials had been purchased by the research center.

Teaching Method and Materials Used in the Linguistic Approach

At the time this study was initiated, there were several sets of "linguistic" readers available for use with children. They were linguistic in the sense that the difficulty of the materials was controlled through using only the most consistent sound-spelling patterns in the beginning materials. In choosing from among the available materials the textbooks which would be used in the study, the research staff was guided by the following statements about language:

1. In alphabetical writing letters are symbols of sounds.
2. The order of letters in a word symbolizes the time-order in which the sounds are made.
3. Sounds that do not symbolize things or ideas are not language. In other words, sounds without meaning are not language.
4. Letters are not transcriptions of sounds in isolation but of sounds in words.
5. Consonantal sounds do not occur in language apart from vowel sounds.

With these principles in mind, a review of the available materials was made to see which of them more nearly followed these principles. The Royal Road Readers published by Chatto and Windus in London were based on the five principles, but there was some hesitation about using them as the basal series because some of the vocabulary was foreign to American children. The Harper Row Linguistic Science Readers also seemed to follow the principles, but only the pre-primers were available at the time. The Lippincott Publishing Company had a complete set of materials available which followed most of the principles. A decision was made to use materials from each of these three publishers. The basal materials consisted of Book I of the Royal Road Readers, the pre-primers of the Linguistic Science Readers, and the primer and first readers of Lippincott's Basic Reading. Other books in the three series were used as supplementary reading materials. A syllabus which coordinated the sequences of sound-spelling patterns introduced in each of the books was compiled and given to each teacher in the linguistic group. See Appendix B for the syllabus and a detailed description of procedures used in presenting the materials.

Since it was thought that some of the children in this approach would not be able at the beginning of the instructional period to deal with the auditory discrimination tasks demanded of them by these materials, readiness materials were provided for each teacher. Ten copies of Getting Ready to Read published by Houghton - Mifflin were supplied for each classroom. The Lippincott workbooks for the first grade program were provided for each child. Additional exercises requiring auditory and visual discrimination were duplicated by the research staff for use by the children in ten classes. The cost of the materials used in this approach was approximately $270.00 per classroom.

The following general guides to method were developed through discussions with the teachers. Each teacher was provided a copy and was asked to refer to it frequently during the instructional period.

1. Children should be taught that each letter has a name and a sound. The letter may be referred to in isolation by its name. The sound of the letter should be presented in words. If there is a need in some individual cases to present a sound in isolation, particular care should be taken not to present an extraneous neutral vowel as a part of a consonant sound (p,b,d,t,k, and g are particularly difficult to say alone).

2. Care should be taken to pronounce words accurately. In cases in which the teacher's regional dialect introduces a sound different from that indicated in the printed material, the teacher should try to produce the sound indicated in the printed material. If it becomes apparent that the majority of the children also prefer the teacher's pronunciation, that sound may be discussed and used as an alternate sound for the spelling pattern being studied. (Example: Log is pronounced differently from rod and not in some areas. The o should then be said to represent either the sound heard in log or the sound heard in rod.)

3. In unstressed one syllable words and in the unaccented syllables of polysyllabic words, any vowel letter may represent a neutral, unstressed vowel sound, (as in canary, camel, terrible, and pilot). This variant pronunciation for any vowel letter should be discussed when occasion for it arises in the use of the materials. Children should not be asked to avoid the use of such a neutral vowel sound; they should be taught that its occurrence is characteristic of the language.

4. Dictation to the children of words to be written is advisable as soon as the children have learned each of the sound-spelling correspondences used in the words to be dictated. If a child makes an error in forming into letters on paper the sounds he hears, he may be asked to read the word as he has written it, particularly if the error involves a spelling which the child has already studied. He should then be asked to correct his error.

5. The use of flash cards is advisable only with regularly spelled words which are used very frequently in the language. (See lists of such words in the syllabus). The initial presentation of such words should be in context and the teacher should urge the child to use the letter knowledge he has in attempting to recognize the words. Flash presentations should occur only after the word has been recognized by the child several times in context.

6. In using the practice reading selections which are included in the basal and supplementary materials, emphasis should be placed upon comprehension, use of context, fluency and expression in oral reading, and ability to read silently.

7. The children within a room should be grouped for instruction in order to care for individual differences in learning rate. With some children it will not be necessary to use all of the materials provided for the teaching of each sound. With other children the teacher may need to supply materials in addition to those outlined in the syllabus.

8. Trade books should be used as supplementary reading after the child has completed the primer level materials included in the syllabus.

9. Children who complete the first grade materials provided may begin work with the second grade Lippincott readers. The second grade reader repeats the spelling patterns introduced in the first grade materials.

Teaching Method and Materials Used in the Control Group

No changes were made in the programs conventionally followed in classes in the control group. All of the teachers employed ability grouping within the classroom and all of them used basal readers as instructional materials. In five of the classes the Ginn reading series was used as the basal. In three classes the Scott, Foresman series was the basal, and in the other two classes the Houghton-Mifflin series was used as the basal series.

A study of the complexity of the materials published by these three companies was made to determine the similarities and differences which existed among them. The Ginn series introduced 326 new words in its first grade program while the Scott, Foresman series introduced 323 words. The Houghton-Mifflin program introduced 315 new words. The three series introduced a common list of 150 words. This meant that approximately 150 words in each series were unique to that particular set of materials. Although they did not introduce the same words, the three series seemed to have somewhat comparable word recognition loads.

All three of the series introduced consonant sounds and digraphs in varying positions in words and in blends. There was some variation in the order of introduction of the sounds, but not a great deal. However, the Houghton-Mifflin series introduced the consonants sounds early in the first grade program. Eighteen consonant sounds were presented in the Houghton-Mifflin readiness program whereas the sounding program began in the Ginn series with the first pre-primer and in the Scott-Foresman series with the second pre-primer. All three of the series asked the children to rely on context as an aid to word recognition, but the Houghton-Mifflin program seemed to place more direct emphasis on the use of context in conjunction with sounding of consonants.

Whether these differences in the basal readers used influenced achievement is not known, but any possible effect on achievement should have been tempered somewhat by the use of co-basals in each classroom. Children in eight of the 10 classes read materials from Houghton-Mifflin, Scott Foresman, and Ginn. All of the children read at least the pre-primers of the three series, most read the primers, and many finished the first readers of each series. Children in the other two classes read books from at least two of the series.

Workbooks to accompany the basal readers used in each classroom were supplied for each child. In eight of the classrooms the children used the Scott Foresman language text, _We Listen, Speak, and Write_. The teachers in the two other classrooms used the teachers' edition of the book. All materials used with the 10 control classes were supplied by the districts themselves.

Supervision of Instruction

All teachers in the two experimental groups spent two weeks preparing for the project during the summer of 1964. The three teachers from District A who were part of the boy-girl experimental group studied for two weeks on the campus of the University of Kansas. All other teachers in the experimental groups attended a workshop held in District B from August 3 through August 13. The project director, a research assistant, and the reading supervisors from Districts A and B made up the staff of the workshop.

The teachers in the boy-girl experimental group began the workshop sessions by studying summaries of research on sex differences in learning and on the interests of boys and girls at the ages of five, six, and seven. Discussions of teaching methods which might be appropriate for sex-segregated reading groups were held, although no fixed lesson plans were devised. The teachers then divided into groups to study the various reading textbooks available in the schools in order to determine which should be used with boys' groups and which should be used with girls' groups. Decisions about which textbook series would be used by girls and which by boys were finally made somewhat arbitrarily, since there was no clear cut agreement that any one series was more boy-oriented or girl-oriented than any other.

The teachers of the linguistic group first studied the materials which they were to use, since the materials were completely new to most of them. One of the first problems to be solved was that of integrating three sets of reading textbooks into a sequential program of instruction. Each teacher studied the sequences of sounds introduced in each of the textbook series. A detailed syllabus was compiled, duplicated, and given to each teacher at the end of the workshop session.

A second project for this group was the writing of lesson plans for use with the pre-primers of the Harper Row Linguistic Science Readers. No teachers' manuals for these books were then available. Lesson plans stressing comprehension and fluency were devised for use with the books. Duplicated copies of the plans were distributed to each teacher. Discussions of teaching methods were carried on with these teachers throughout the two-week period.

Orientation meetings were held for teachers in each of the three groups just prior to the opening of school in the fall. The control group teachers met with the research staff on September 4, the boy-girl group on September 3, and the linguistic group on September 2. The teachers were given instructions for the testing program and written outlines of time allotments and schedules which were to be followed.

Small-group meetings involving the research staff and the teachers in each of the experimental groups were held periodically during the 140-day instructional period. The teachers in the linguistic group from Districts B and C met in the afternoon after the close of the school day on October 7, October 21, November 18, December 16, February 10, and March 10. Teachers in this group from District A met with the research staff on the day preceding each of the dates given above. Teachers from the boy-girl group in Districts B and C met on September 30, October 21, October 28, December 9, January 20 and March 16. Again, the teachers from District A met on the day preceding each of these dates. Group meetings for the control teachers were held on October 21 and January 13.

The director of the research project visited in each classroom at least once during the instructional period. In the linguistic group, four classrooms were visited in November, three in December, three in January, and one in February. In the boy-girl group, three visits were made in November, five in January, two in February, and two in March. Control classrooms were visited in January, February, and March. During these visits, the research director observed the reading sessions and made suggestions or answered questions posed by the teacher. Observations made during these visits sometimes formed the basis for discussions held in the small-group meetings. In addition to these visits, the director often saw the teachers informally when she was in the schools for other purposes. Some instructional problems were solved through discussions over the phone.

Supervision of instruction was also provided by the supervisors in each of the three school districts. In District A, the reading supervisor made frequent observations in the research classrooms and discussed her observations with the project director. In District B, the elementary supervisor observed the reading classes in each of the 15 research classrooms at least once during the months of January, February, or March. In District C, the curriculum coordinator visited the six teachers and discussed the project with them. All three of the supervisors were also kept constantly informed of what was happening through conversations with the building principals.

Time Allotments

The amount of time spent per day in reading instruction should logically have some influence upon the reading achievement of the pupils. With this assumption in mind, the teachers and the research staff recognized the need to establish uniform time allotments across the three treatment groups and among the 30 classrooms. There were two major complicating factors in establishing such uniformity, however. One was that the length of the school day varied from one school district to another. In District A the school day was six hours long. In Districts B and C, the school day was one hour shorter. In addition, teachers in District A were accustomed to emphasizing reading and language instruction throughout most of their six-hour day, whereas teachers in District B were encouraged to spend time with non-reading activities in science and social studies.

The second difficulty was that of defining what was meant by "reading" instruction. Since writing and spelling were an integral part of the linguistic approach to reading being used in 10 of the classrooms, the reading period was a "language period" rather than a reading period only. During the last weeks of the instructional period, much time was spent in the linguistic groups in discussing the meanings of new words which appeared in the reading material. Thus, any schedule for reading which included these language activities for the linguistic group also had to include them for the boy-girl group and the control group.

Since such fixed schedules as those for music, art, and physical education classes varied from one school building to another, no attempt was made to designate certain hours of the day which should be given to reading instruction. After much discussion of all the variables involved in controlling instructional time, the following instructions were given to all the teachers in the project:

> No more than three hours per day of instructional time should be devoted to reading and related language skills in any classroom. Reading, independent seatwork, writing, speaking, listening, and oral reading to the class by the teacher are to be a part of the three hour block of time. In order to provide more flexibility in scheduling, the teacher may wish to calculate instructional time on a weekly basis rather than a daily basis. In that case, the time spent in teaching reading and related language skills may be greater or less than three hours per day, but should be no more or less than 15 hours per week.
>
> Of the three hours devoted to language arts instruction, two should be used for reading groups and independent seatwork which is necessary to support the reading instruction. For the linguistic group, writing will also be included in the two hour block, although additional practice in writing may be provided occasionally. The teacher may wish to strive for 10 hours per week of reading instruction rather than two hours per day.

All teachers were asked to keep daily records of the amount of time spent in each activity which occurred during the day. After one month of following the instructions given above, the teachers in Districts B and C began to protest that they had no time for instruction in areas other than the language arts and the subjects taught by visiting special teachers. After discussions with the teachers and the supervisors, the instructions were revised. The following instructions were observed from the first of November to the end of the instructional period in April:

Time Allotments

I. Linguistic Group

  A. 2 hours, 15 minutes per day or 11 1/4 hours per week in direct reading instruction, which is to include:

1. Reading groups and time spent by children at individual work while children are reading.

2. Presentation and checking of workbooks (whether done with groups separately or with the whole class).

3. Writing instruction and practice time.

B. 30 minutes per day or 2 ½ hours per week in language arts instruction, which is to include:

1. Reading stories or poetry aloud to the children.

2. Instruction in listening and in speaking - either use of appropriate sections of We Listen, Speak, and Write or sharing and conversation time.

II. Control and Boy-Girl Groups

A. 2 hours per day or 10 hours per week in direct reading instruction, which is to include:

1. Reading groups and time spent by children at individual work while other children are reading (the individual work may be writing practice).

2. Presentation and checking of workbooks (whether done with groups separately or with the whole class).

B. 45 minutes per day or 3 3/4 hours per week in language arts instruction which is to include:

1. Direct writing instruction (and most of the practice time).

2. Instruction in listening and speaking - either use of We Listen, Speak, and Write or sharing or conversation time.

3. Reading stories or poetry to the children.

III. All Groups

A. In all groups effort should be made to emphasize the activity approach to science and social studies and to minimize the reading in these subjects.

B. Some reading will be necessary in the arithmetic period, but the amount probably will be about the same in each classroom, so this reading should not concern you.

This revision of time allotments reduced the total amount of time spent from 3 hours per day to 2 hours and 45 minutes, and it defined more exactly what was meant by direct reading instruction.

Readiness for reading and achievement in the language arts were measured through an extensive testing program which was devised by the directors of the 27 co-ordinated projects. The pre-tests, which consisted of three readiness tests and an intelligence test, were administered to all subjects in the experimental and control groups during the month of September. The post-tests, which measured reading, word-study skills, spelling, composition, and attitude toward reading, were administered in April and May following the completion of a 140-day instructional period.

Each of the four pre-tests was administered as a group test by the classroom teacher. The following tests were completed by each child; (1) the Murphy-Durrell Diagnostic Reading Readiness Test, (2) the Metropolitan Readiness Tests, (3) the Pintner-Cunningham Primary Test of General Ability, and (4) the Thurstone Primary Perception Tests. It was suggested to the teachers that the tests be administered in the order in which they are listed above. The Murphy-Durrell and the Metropolitan were given first because they contained sub-tests designed to measure the auditory and visual discrimination abilities which are often taught as a part of a reading readiness program. Teachers were asked to refrain from introducing any kind of instruction in these skills until the first two tests had been administered. The Thurstone Primary Perception Tests were given last because delivery of the test blanks was delayed.

It was recommended that these group tests be administered to only one-half of the class at any one sitting. In District A, school began on August 31, with the first-grade children attending half-day sessions for the first week. One-half of the children came to school for the morning session and the other half of each class attended the afternoon session. It was thus possible for the teachers to administer the tests to small groups of children without encountering any scheduling problems. In Districts B and C, school opened on September 8 with all children attending full-day sessions. Teachers in these districts were asked to arrange for only one-half of the class to be present in the classroom for each of the testing periods. Where this was not possible, they were asked to secure the assistance of an additional teacher or staff member who would help with the supervision of the class. These procedures were followed in all classrooms.

All pre-tests, with the exception of the Thurstone Primary Perception Tests, were completed before September 18. This schedule allowed a 10-day period in which the tests were given. Teachers were asked to space the testing over the 10-day period in order to reduce test-fatigue on the part of the children. Many of the teachers reported, however, that the children did tire easily under the best schedules they could devise.

The following general instruction concerning testing were given to the teachers:

1. Read the manual of directions for each test carefully and follow them exactly.
2. Post a sign on your door whenever testing is in progress in order to avoid interruptions.
3. Use the red lead pencils with your test packets for all tests.
4. A stop watch would be quite helpful in administering the Murphy-Durrell test. If you do not have access to a stop watch, you may be able to locate a watch or clock with a second hand.
5. Markers may be needed by your children for some of the tests. You are to provide these for your own classrooms.

The instructional period was scheduled to begin on September 21; however, some testing was conducted after this period began. Because the Thurstone Primary Perception Test blanks did not arrive in time for the tests to be given during the scheduled testing period, they were given during the instructional period. The Pattern Copying test was given on September 21 and the Identical Forms test on September 22. Both were given at a time of the day which was not scheduled for reading instruction. In one classroom the teacher allowed the children too much time to complete the Identical Forms test, so it was re-administered during the second week of the instructional period. Some make-up tests were also completed during the first two weeks of the instructional period.

In order to test the assumption that all subjects began the instructional period with no reading ability, a reading achievement test was administered to some of the children. Teachers were asked to list for the research staff the names of the children who demonstrated any reading ability whatsoever. The Detroit Word Recognition Test was administered individually by a research assistant to each of the children who were presumed to have reading ability. This testing was completed prior to or during the first week of the instructional period.

The final testing period began on the 140th day of the instructional period. The San Diego Reading Attitude Inventory was administered to all children in the project on the final day of the instructional period. The test was scheduled at a time other than the regular reading time, since the day counted as an instructional day also.

All subtests of the Stanford Achievement Test, Primary I, Form X, were completed within a five day period following the close of the instructional period. Classroom teachers were responsible for administering this group test, but each teacher was assisted by a member of the research staff or by some local school person. These assistants were qualified teachers who were instructed to assist with timing and with the supervision of the children. Group meetings with the teachers and the assistants were held in each school district on the afternoon prior to the first day of testing in order to provide instructions on testing procedures. The teachers had been informed earlier that the Stanford Achievement Test would be used, but none knew that Form X was the form chosen for use in the project. Test blanks and manuals were distributed to the teachers only after the close of the last school day of the instructional period. The general instructions observed in the pre-test sessions were again followed.

A second series of achievement tests was given to a sample of 50 children from each treatment group, or to a total of 150 children. The following tests were administered individually to each of the children in the subsample: (1) the Gilmore Oral Reading Test, Form A, (2) the Gates Word Pronunciation Test, and (3) the Fry Oral Test of Phonetically Regular Words. The three tests were administered in the order named during one sitting with each child. All individual testing was completed within a five day period following the last day of instruction.

The children who made up the subsample of 150 children were chosen from the total group through stratified random sampling. The subjects in each treatment group were stratified according to sex and teacher. Subjects were randomly chosen from each stratum in sufficient numbers to constitute a sample of 50 children from each treatment group. Alternates from each stratum were also chosen randomly and listed as substitutes to be used in case an original subject was absent on the day of testing.

Prior to the beginning of the testing period the three oral reading tests were administered to eight first grade children who were not included as subjects in the experiment. Responses to the tests were taped and these tapes were used in training sessions with the teachers who were to administer the tests to the children in the subsample of 150. These teachers, who were regularly-employed substitutes teachers, participated in three-hour training sessions to become acquainted with the tests and with the system for recording responses on the Gilmore. They then practiced individually with children in their home neighborhoods prior to using the tests with children in the experiment. A tape recorder was provided for each examiner so that all test responses could be recorded and played back later. All test blanks were checked for accuracy through the use of these tapes.

Two writing samples were obtained from all pupils in all treatment groups as the final measure of achievement. Following directions provided by a sub-committee of the project directors, each classroom teacher directed the children in her class to write two original compositions. On May 20 all children were asked to write their favorite stories. No other motivation or instruction was given; hence, this was called the restricted stimulus measure. On May 21 each teacher elicited stories using procedures which had proven successful in the past in her particular classroom. This composition was called the unique stimulus measure. All of these compositions were collected by the research staff but only those written by the 150 children who took the oral reading tests were analyzed and described.

Copies of the readiness and achievement tests administered to children in the project and directions for eliciting and scoring the restricted stimulus writing samples may be seen in the Appendix D.

The scoring of all tests used in the project was done by members of the research staff. After the initial scoring of each test was completed, a check on the accuracy of scoring was made by re-scoring every fifth test booklet. Scoring on the Murphy-Durrell readiness test was found to be 99.8 per cent accurate. In no case did scoring errors change the total raw score more than one point in 118 possible points. A similar pattern was found to exist when the Thurstone Identical Forms test was checked for scoring accuracy.

Scoring on the Metropolitan Readiness Tests was 99.4 per cent accurate. Since the copying subtest required the use of subjective judgment in scoring, the accuracy of the scoring on the Metropolitan was somewhat lower than that on the Murphy-Durrell and the Identical Forms tests, which were totally objective. However, in no case was a child's total score on the Metropolitan in error more than two points from a total possible of 103 points.

The Thurstone Pattern Copying Test was most difficult to score reliably. Since the scorer's judgment was involved in scoring each of the 36 items on the test, the re-checking process led to a number of changes in decisions within a single test booklet. Nine percent of the scoring decisions were altered when the test booklets were rescored. In some cases a child's score was altered as much as 10 points in the rescoring.

The Stanford Achievement Test was also checked for accuracy. Since all responses were scored objectively, scoring accuracy was high for this test. Scoring was found to be 99.8 per cent accurate. In only one case was a child's score in error more than two points in a test with a total of 251 points possible.

Although the Pintner-Cunningham and the San Diego Attitude Inventory tests were not checked for scoring accuracy, it was assumed that accuracy levels were similar to those found for the Murphy-Durrell and the Stanford Achievement Test. Both the Pintner-Cunningham and the Attitude Inventory were scored objectively by the staff members who scored the other tests discussed above.

All data collected throughout the study to describe the children and the teachers involved in the experiment were coded and recorded on data cards. Copies of all data cards were sent to the coordinating center for the cooperative research project at the University of Minnesota. Analyses of the data in the present study were carried out at the University of Kansas. Results of these analyses are reported in the following chapter.

CHAPTER IV

ANALYSIS OF DATA

Introduction

In order to determine how nearly the three treatment groups were equated with one another at the beginning of the instructional period, a series of readiness, intelligence, and achievement tests were administered to the children in each of the thirty classrooms. Chronological age and attendance during the instructional period were studied as control variables. At the end of the instructional period a series of achievement tests measuring both silent and oral reading abilities were administered. Attitude toward reading and ability to write a composition were also studied. Statistical analyses were made in order to determine the significance of differences between treatment groups on each of the variables studied. Sex differences on each of the variables were also studied.

Simple analysis of variance was used to compare the means of the independent groups. It was realized that the assumption of randomization was not satisfied. However, since randomization was not administratively possible, it was decided that the analysis of variance procedure could be used if the findings were interpreted cautiously with initial group differences being carefully considered.

An inspection of the variances for each of the groups being compared suggested that the groups were homogeneous with respect to their performances on each of the criterion measures. It was assumed because the sample consisted of over 600 cases that the distribution of trait values for each of the criterion measures approached normality to a sufficient degree to permit use of the F statistic. It was further believed that the minor deviations from this assumption were not so serious as to invalidate the results of the comparisons of group means with the F test.

In cases where the F statistic indicated significant differences among groups on criterion means, the t test was used to study differences between pairs of group means. The two-tailed t test appropriate for testing the significance of difference between means of independent groups was used.

Comparison of Group Means for Intelligence and Chronological Age

The selection procedures used in constituting the treatment groups were employed in such a way that the three groups were thought to be roughly equated on chronological age and on intelligence. The Pintner-Cunningham test was administered before the instructional period began in order to determine whether gross differences between groups on the intelligence variable existed and to determine the extent to which it might be necessary to exercise statistical control for group differences on the intelligence variable. Age in months on October 1 was recorded for each child in order to study the chronological age factor. Means and F values for these two variables are presented in Table 3.

An inspection of Table 3 leads to the conclusion that there were no significant differences among the treatment groups on the variable of chronological age or the variable of intelligence as measured by the Pintner-Cunningham test. However, since the purpose of the present study was to study sex differences in achievement under the three treatments, an analysis of the differences between means of boys assigned to each treatment group and of girls assigned to each treatment group was carried out. Means, F values, and t values for chronological age and for intelligence for boys and for girls are presented in Table 4.

TABLE 3

MEANS AND F VALUES FOR TREATMENT GROUPS ON CHRONOLOGICAL AGE AND INTELLIGENCE

	Chronological Age (Months)	Intelligence Quotient
Means		
Sex-grouping approach	76.7	105.6
Linguistic approach	76.9	104.4
Control approach	76.8	102.6
F Values	.14	2.83
$F_{.01}$ (df 2,630) = 4.66		
$F_{.05}$ (df 2,630) = 3.02		

No significant differences were found among the means for boys assigned to each treatment group for the factors of age and IQ. There were, however, significant differences among the means for the girls in the three treatment groups on the intelligence factor. An analysis of the differences between pairs of means through use of the t test revealed that the girls in the sex-grouping approach had a significantly higher mean on the intelligence test than did the girls in the control group. No other significant differences were found.

Assessment of Initial Reading Ability

In order to test the assumption that the children began the instructional period with no reading ability, the Detroit Test of Word Recognition was administered to all children in the study who demonstrated ability to recognize any words at sight. The test was administered individually to 19

TABLE 4

MEANS, F VALUES, AND t VALUES FOR BOYS AND FOR GIRLS IN TREATMENT GROUPS ON CHRONOLOGICAL AGE AND INTELLIGENCE

	Chronological Age (Months)	Intelligence Quotient
Means - Boys		
Sex-grouping approach	77.4	103.2
Linguistic approach	77.9	101.7
Control approach	77.4	101.5
F Values	.40	.52
$F_{.01}$ (df 2,288) = 4.71		
$F_{.05}$ (df 2,288) = 3.04		
Means - Girls		
Sex-grouping approach	75.9	108.1
Linguistic approach	76.1	106.5
Control approach	76.5	103.3
F Values	.61	4.20*
$F_{.01}$ (df 2,339) = 4.71		
$F_{.05}$ (df 2,339) = 3.04		
t Values		
Linguistic approach Sex-grouping approach		.89
Linguistic approach Control approach		1.93
Sex-grouping approach Control approach		2.91**

* Significant at .05 level
** Significant at .01 level

children from the sex-grouping approach, 27 children from the linguistic approach, and 19 from the control approach. The scores made by the children who remained in the study throughout the instructional period are reported in Table 5.

If scores of 10 or more are taken arbitrarily to indicate "reading ability," it can be seen that eight children in the sex-grouping approach, seven in the linguistic approach, and eight in the control approach possessed some reading ability when they began the instructional period. Since the children who possessed such ability were equally distributed across the three treatment groups, they were retained in the study.

Analysis of Readiness Factors

Three readiness test batteries were administered to all the children in the study in a further attempt to assess the equality of children assigned to the three treatment groups. The Metropolitan Readiness Tests, the Murphy-Durrell Diagnostic Readiness Test, and the Thurstone Tests of Visual Perception were administered.

The Metropolitan Readiness Tests consisted of six subtests designed to measure knowledge of word meaning, listening ability, visual matching ability, number knowledge, copying ability, and knowledge of the alphabet. Means, F values, and t values for these subtests and for the total score on the Metropolitan are reported in Table 6.

Significant differences among the means for treatment groups were found to exist on the listening and the matching subtests of the Metropolitan Readiness Tests. There were no significant differences among the group means for the total score on the Metropolitan nor for the subtests measuring word meaning, number knowledge, copying ability, or knowledge of the

TABLE 5

SCORES ON THE DETROIT TEST OF WORD RECOGNITION

Pupils	Sex-Grouping Approach	Linguistic Approach	Control Approach
1	1	1	1
2	2	1	2
3	2	2	2
4	5	2	2
5	5	2	3
6	6	2	5
7	6	3	9
8	8	4	10
9	9	4	11
10	10	4	12
11	10	5	20
12	14	5	21
13	16	6	25
14	17	7	25
15	19	9	28
16	20	10	
17	28	12	
18		12	
19		15	
20		15	
21		17	
22		17	

TABLE 6

MEANS, F VALUES, AND t VALUES FOR TREATMENT GROUPS ON METROPOLITAN READINESS TESTS

	Word Meaning	Listening	Matching	Numbers	Copying	Alphabet	Total
Means							
Sex-grouping approach	9.8	10.2	9.3	13.9	7.9	11.2	62.2
Linguistic approach	9.7	10.5	8.6	13.8	7.6	10.7	60.9
Control approach	9.3	9.9	8.4	13.2	7.9	10.7	59.4
F Values	1.78	3.76*	4.27*	1.65	.47	1.16	2.35
$F_{.01}$ (df 2,630) = 4.66							
$F_{.05}$ (df 2,630) = 3.02							
t Values							
Linguistic approach Sex-grouping approach		1.52	2.27*				
Linguistic approach Control approach		2.79**	.50				
Sex-grouping approach Control approach		1.24	2.77**				

* Significant at .05 level
** Significant at .01 level

alphabet. An analysis of the differences between pairs of means for the listening and matching subtests indicated that the children assigned to the linguistic group had a significantly higher mean for listening than did the children assigned to the control group. The children in the sex-grouping approach had a significantly higher mean for visual matching than the children in the other two groups.

An analysis of the differences among means for boys and among means for girls assigned to each treatment group is presented in Table 7. An inspection of the table reveals that the superiority of the linguistic group over the control group in listening ability existed primarily among the boys assigned to those groups. The superiority of the children in the sex-grouping approach over the children in the other two groups on visual matching ability was found to exist primarily among the girls. The analysis by sex groups also revealed a significant difference among means for the girls on the word meaning subtest of the Metropolitan. The girls in the linguistic group had a significantly higher mean on this subtest than the girls in the control group.

The Murphy-Durrell Diagnostic Readiness Test contained subtests which measures ability to hear sounds in words, knowledge of letter names, and ability to learn and remember word forms. The Thurstone tests consisted of two measures of visual perception. One was a test of the child's ability to copy geometric figures and the other was a test of the speed with which children could detect likenesses in visual patterns. Scores on the Thurstone copying test were not considered reliable because accuracy in scoring the test was found to be quite low. The scores were, therefore, deleted in the final analysis of the data. Means, F values, and t values for the Murphy-Durrell subtests and for the Thurstone test of perceptual speed are reported in Table 8.

Significant differences among means for the treatment groups were found to exist for the Thurstone Identical Forms Test and for the learning rate subtest of the Murphy-Durrell. Comparisons of pairs of means indicated that the children in the sex-grouping approach had a significantly higher

TABLE 7

MEANS, F VALUES, AND t VALUES FOR BOYS AND FOR GIRLS IN TREATMENT GROUPS ON METROPOLITAN READINESS TESTS

	Word Meaning	Listening	Matching	Numbers	Copying	Alphabet	Total
Means - Boys							
Sex-grouping approach	10.2	10.0	8.9	14.1	8.0	11.0	62.1
Linguistic approach	9.8	10.5	8.5	13.7	7.6	10.4	60.4
Control approach	10.1	9.6	8.3	13.3	7.7	10.1	59.1
F Values	.55	3.19*	.97	.82	.27	1.51	1.24
$F_{.01}$ (df 2,288) = 4.71 $F_{.05}$ (df 2,288) = 3.04							
t Values							
Linguistic approach Sex-grouping approach		1.60					
Linguistic approach Control approach		2.59*					
Sex-grouping approach Control approach		1.06					
Means - Girls							
Sex-grouping approach	9.4	10.4	9.8	13.7	7.8	11.4	62.4
Linguistic approach	9.7	10.5	8.7	13.9	7.6	11.0	61.2
Control approach	8.8	10.0	8.5	13.2	8.0	11.1	59.7
F Values	3.20*	1.19	4.41*	1.04	.61	.30	1.19
$F_{.01}$ (df 2,339) = 4.71 $F_{.05}$ (df 2,339) = 3.04							
t Values							
Linguistic approach Sex-grouping approach	.82		2.54*				
Linguistic approach Control approach	2.56*		.26				
Sex-grouping approach Control approach	1.56		2.94**				

* Significant at .05 level
** Significant at .01 level

TABLE 8

MEANS, F VALUES, AND t VALUES FOR TREATMENT GROUPS ON THURSTONE AND MURPHY-DURRELL READINESS TESTS

		Murphy-Durrell		
	Thurstone Identical Forms	Phonemes	Letter Names	Learning Rate
Means				
Sex-grouping approach	18.2	29.9	38.5	10.5
Linguistic approach	16.4	31.0	37.7	10.8
Control approach	16.1	29.6	37.9	9.8
F Values	6.77**	.65	.25	3.23*
$F_{.01}$ (df 2,630) = 4.66				
$F_{.05}$ (df 2,630) = 3.02				
t Values				
Linguistic approach Sex-grouping approach	2.74**			.95
Linguistic approach Control approach	.55			2.49*
Sex-grouping approach Control approach	3.46**			1.79

* Significant at .05 level

** Significant at .01 level

mean on the Thurstone visual perception test than the children in each of the other two groups. The significant difference among means on learning rate was found to be a difference favoring the linguistic group over the control group.

In carrying further the analysis of the differences among means for the Thurstone and Murphy-Durrell Tests, it was found that the differences on the Thurstone test existed among both boys and girls. The difference among means on the learning rate test existed primarily among the girls assigned to the three treatment groups. This analysis is presented in Table 9. The use of the t test to study differences in pairs of means led to the conclusion that the boys in the sex-grouping approach had a higher mean on the test of perceptual speed than did the boys in the control approach and that the girls in the sex-grouping approach had a higher mean for perceptual speed than the girls in either of the other two approaches. The girls in the linguistic approach had a significantly higher mean than the girls in the control approach on the learning rate subtest of the Murphy-Durrell.

In general, it could be said that the three treatment groups were not significantly different from one another on readiness factors with the exception of the factor of visual perception where the control group seemed to possess less ability than the other two groups, and where the boy-girl group possessed the greatest ability. There were more significant differences among the means for girls assigned to the treatment groups than there were among the means for boys assigned to each treatment group.

Sex Differences on Readiness Factors

Since the general area of sex differences in learning ability was a matter of central importance in the present study, an analysis was made of

TABLE 9

MEANS, F VALUES, AND t VALUES FOR BOYS AND GIRLS IN TREATMENT GROUPS ON THURSTONE AND MURPHY-DURRELL READINESS TESTS

	Thurstone Identical Forms	Murphy-Durrell		
		Phonemes	Letter Names	Learning Rate
Means - Boys				
Sex-grouping approach	17.8	28.1	38.0	10.6
Linguistic approach	16.0	29.7	36.3	10.3
Control approach	15.5	27.8	36.7	10.1
F Values	3.31*	.56	.57	.35
$F_{.01}$ (df 2,288) = 4.71				
$F_{.05}$ (df 2,288) = 3.04				
t Values				
Linguistic approach Sex-grouping approach	1.84			
Linguistic approach Control approach	.59			
Sex-grouping approach Control approach	2.42*			
Means - Girls				
Sex-grouping approach	18.7	31.8	39.0	10.5
Linguistic approach	16.8	32.0	38.8	11.2
Control approach	16.6	30.9	38.7	9.6
F Values	4.09*	.25	.02	4.54*
$F_{.01}$ (df 2,339) = 4.71				
$F_{.05}$ (df 2,339) = 3.04				
t Values				
Linguistic approach Sex-grouping approach	2.27*			1.29
Linguistic approach Control approach	.27			3.11**
Sex-grouping approach Control approach	2.81**			1.58

* Significant at .05 level
** Significant at .01 level

sex differences on the readiness factors on which measures were secured before the instructional period began. Means were computed for all boys and for all girls regardless of the treatment group to which they were assigned. These means and F values used in comparing the means are reported in Table 10.

A study of Table 10 reveals that the boys in the study were significantly older than the girls, while the girls attained a significantly higher mean on the Pintner-Cunningham intelligence test than the boys. The mean for boys was found to be significantly higher than that for girls on the test of knowledge of word meanings, while girls had a significantly higher mean than boys on the test of letter knowledge and on the test of ability to hear sounds in words.

Comparison of Attendance Records for Treatment Groups

Since the number of days a child attended school during the 140-day instructional period was considered to be a variable which could influence reading achievement, attendance records were kept for each child in the study. The mean number of absences from school during the instructional period was computed for each treatment group and for all boys and all girls. The mean for the sex-grouping approach was 8.5 days, for the linguistic approach was 8.9 days, and for the control approach was 9.1 days. There were no significant differences among means for the treatment groups nor between means for boys and girls.

Analysis of Silent Reading Abilities

The Stanford Achievement Test, which was administered to all children in the study, contained subtests of word reading, paragraph meaning, vocabulary, spelling, and word study. Raw scores on each of the five subtests

TABLE 10

MEANS AND F VALUES ON READINESS FACTORS FOR BOYS VERSUS GIRLS

	Means		F Values (df 1,631)
	Boys	Girls	
Chronological Age	77.6	76.2	16.59**
Intelligence Quotient	102.3	105.9	12.02**
Metropolitan Readiness Tests			
Word Meaning	10.0	9.3	12.86**
Listening	10.0	10.3	2.24
Matching	8.6	9.0	1.59
Numbers	13.7	13.6	.22
Copying	7.8	7.8	.04
Alphabet	10.5	11.2	4.44*
Total	60.7	61.0	.09
Thurstone Test			
Identical Forms	16.5	17.3	2.22
Murphy-Durrell Test			
Phonemes	28.5	31.6	8.90**
Letter Names	37.1	38.8	3.46
Learning Rate	10.4	10.4	.00

* Significant at .05 level
**Significant at .01 level

were recorded for each child and means for treatment groups were computed. An analysis of the differences between these means is presented in Table 11.

Significant differences among the means for the treatment groups were found to exist for the word reading, spelling, and word study subtests of the Stanford Achievement Test. Comparison of pairs of means indicated that the linguistic approach produced significantly higher means than either of the other approaches on word reading, spelling, and word study. The sex-grouping approach produced a significantly higher mean for word reading than did the control approach. There were no significant differences among the groups on the test of paragraph meaning, although the observed differences favored the linguistic approach over both the control and the sex-grouping approaches.

When the results on the Stanford Achievement Test for boys and for girls assigned to the treatment groups were analyzed, it was found that there were more significant differences among means for girls than there were among means for boys. Significant differences among the means for boys in the three treatment groups were found only for word reading. The boys in the linguistic group had a significantly higher mean than boys in either of the other two groups and the boys in the sex-grouping approach had a significantly higher mean than those in the control approach. Differences among means for the girls were found to be significant for word reading, spelling, and word study and to favor the linguistic approach over the other two approaches. These comparisons are presented in Table 12.

Since one of the hypotheses being tested in the study was a hypothesis that the achievement of girls would exceed that of boys under each of the three treatments, an analysis was also made of differences between means for boys and for girls within each approach. No significant differences

TABLE 11

MEANS, F VALUES, AND t VALUES FOR TREATMENT GROUPS ON THE STANFORD ACHIEVEMENT TEST

	Word Reading	Paragraph Meaning	Vocabulary	Spelling	Word Study
Means					
Sex-grouping approach	24.4	25.5	24.6	13.9	40.8
Linguistic approach	27.4	25.8	24.8	15.0	42.7
Control approach	23.0	23.9	24.0	13.3	40.4
F Values	25.25**	2.70	.84	5.33**	4.15*
$F_{.01}$ (df 2,630) = 4.66					
$F_{.05}$ (df 2,630) = 3.02					
t Values					
Linguistic approach Sex-grouping approach	4.66**			2.03*	2.18*
Linguistic approach Control approach	7.09**			3.15*	2.67**
Sex-grouping approach Control approach	2.32*			1.27	.56

* Significant at .05 level
** Significant at .01 level

between means of groups were found for any of the subtests on the Stanford except that of paragraph meaning. On this subtest the girls in each approach had significantly higher means than the boys who had received the same instruction. The differences were significant at the .05 level of

TABLE 12

MEANS, F VALUES, AND t VALUES FOR BOYS AND FOR GIRLS IN TREATMENT GROUPS ON THE STANFORD ACHIEVEMENT TEST

	Word Reading	Paragraph Meaning	Vocabulary	Spelling	Word Study
Means - Boys					
Sex-grouping approach	24.4	24.3	24.8	13.7	40.6
Linguistic approach	26.5	23.8	24.8	14.2	41.3
Control approach	22.1	21.9	24.7	12.8	39.5
F Values	9.97**	1.85	.01	1.48	1.07
$F_{.01}$ (df 2,288) = 4.71 $F_{.05}$ (df 2,288) = 3.04					
t Values					
Linguistic approach Sex-grouping approach	2.29*				
Linguistic approach Control approach	4.53**				
Sex-grouping approach Control approach	2.46*				
Means - Girls					
Sex-grouping approach	24.4	26.9	24.4	14.2	41.1
Linguistic approach	28.1	27.3	24.7	15.6	43.8
Control approach	23.6	25.3	23.5	13.7	41.0
F Values	16.44**	1.73	1.19	4.48*	3.62*
$F_{.01}$ (df 2,339) = 4.71 $F_{.05}$ (df 2,339) = 3.04					
t Values					
Linguistic approach Sex-grouping approach	4.11			2.04**	7.09**
Linguistic approach Control approach	5.56**			2.92**	7.54**
Sex-grouping approach Control approach	1.00			.73	.22

* Significant at .05 level
** Significant at .01 level

confidence in the sex-grouping approach and the linguistic approach and at the .01 level of confidence in the control approach.

Analysis of Attitudes Toward Reading

The San Diego Attitude Inventory was administered to all children in the study at the close of the instructional period. In taking the test the children were required to answer with Yes or No a series of 25 questions about their reading preferences and interests. Table 13 presents the mean on the attitude inventory for each treatment group and reports the F and t values used in comparing differences between the means. A study of the table leads to the conclusion that children in the linguistic approach had a significantly higher mean on the attitude inventory than the children in the other two approaches.

Analysis of Oral Reading Abilities

Three oral reading tests were administered individually to a sample of 50 children from each of the three treatment groups. The tests administered were the Gilmore Oral Reading Test, the Fry Oral Test of Phonetically Regular Words, and the Gates Word Pronunciation Test.

Scores for accuracy of oral reading and for rate of oral reading were computed from records of performance on the Gilmore Oral Reading Test. As each child read orally from the paragraphs in the test booklet, the examiner recorded all errors committed except errors involving hesitation and repetition.

Following directions given in the manual, the examiner computed a total score for each child which reflected the number of paragraphs he was able to read without committing more than 10 errors per paragraph. This raw score

TABLE 13

MEANS, F VALUES, AND t VALUES FOR TREATMENT GROUPS ON THE SAN DIEGO ATTITUDE INVENTORY

	Attitude Inventory
Means	
Sex-grouping approach	18.4
Linguistic approach	19.5
Control approach	17.8
F Values	11.33**
$F_{.01}$ (df 2,630) = 4.66 $F_{.05}$ (df 2,630) = 3.02	
t Values	
Linguistic approach Sex-grouping approach	3.29**
Linguistic approach Control approach	4.31**
Sex-grouping approach Control approach	1.56

* Significant at .05 level
**Significant at .01 level

was translated into a grade level score through the use of a table of norms presented in the test manual. A rate score was also computed for each child. The rate score was based on the paragraphs which the child was able to read while committing no more than 10 but no less than 2 errors per paragraph. The number of words read per minute in these paragraphs became the rate score.

The Fry Oral Test of Phonetically Regular Words was a list of 30 words in which the spelling patterns used to represent the sounds became progressively more obscure. The test was designed to favor children who had been taught in the linguistic approach. The Gates Word Pronunciation Test contained 40 words customarily presented as sight words in basal readers. The test theoretically favored the children in the sex-grouping approach and the control approach over the children in the linguistic approach.

Means for treatment group, F values, and t values for the Gilmore, Fry, and Gates tests are presented in Table 14. An inspection of the table reveals that there were no significant differences among means for the treatment groups on either the accuracy or the rate scores on the Gilmore Oral Reading Test. Significant differences favoring the linguistic approach over the other two approaches were found among the means on the Fry and Gates word pronunciation tests.

Table 15 presents a study of means on these tests for boys and for girls assigned to the three treatment groups. The differences among the means for the girls on the Fry and Gates tests followed those of the total group, with the linguistic approach producing significantly greater means than the other two approaches. The boys in the linguistic group also had a significantly higher mean on the Fry test than boys in the other approaches, but there were no significant differences among means for the boys on the Gates test, although the F value was close to the value needed to establish significance. There were no significant differences between means for the boys and means for the girls within a treatment group on any of the four tests of oral reading.

TABLE 14

MEANS, F VALUES, AND t VALUES FOR TREATMENT GROUPS ON ORAL READING TESTS

	Gilmore Oral Reading Test			
	Accuracy (grade level)	Rate (Words per minute)	Fry Test Word Reading	Gates Test Word Reading
Means				
Sex-grouping approach	3.03	55.3	10.4	15.8
Linguistic approach	3.39	55.4	18.6	20.5
Control approach	3.05	57.5	10.3	15.5
F Values	1.65	.19	17.76**	7.40**
$F_{.01}$ (df 2,147) = 4.78 $F_{.05}$ (df 2,147) = 3.07				
t Values				
Linguistic approach Sex-grouping approach			4.98**	3.15**
Linguistic approach Control approach			4.80**	3.24**
Sex-grouping approach Control approach			.03	.21

* Significant at .05 level
**Significant at .01 level

TABLE 15

MEANS, F VALUES, AND t VALUES FOR BOYS AND FOR GIRLS IN TREATMENT GROUPS ON ORAL READING TESTS

	Gilmore Oral Reading Test			
	Accuracy (grade level)	Rate (Words per minute)	Fry Test Word Reading	Gates Test Word Reading
Means - Boys				
Sex-grouping approach	2.93	57.4	10.0	15.5
Linguistic approach	3.06	53.3	18.1	19.2
Control approach	2.99	53.8	9.0	14.4
F Values	.10	.33	10.69**	3.05
$F_{.01}$ (df 2,72) = 4.92 $F_{.05}$ (df 2,72) = 3.13				
t Values				
Linguistic approach Sex-grouping approach			3.82**	
Linguistic approach Control approach			3.94**	
Sex-grouping approach Control approach			.51	
Means - Girls				
Sex-grouping approach	3.12	53.3	10.7	16.0
Linguistic approach	3.72	57.6	19.2	21.8
Control approach	3.11	61.2	11.6	16.6
F Values	2.20	1.04	7.46**	4.58**
$F_{.01}$ (df 2,72) = 4.92 $F_{.05}$ (df 2,72) = 3.13				
t Values				
Linguistic approach Sex-grouping approach			3.72**	2.66*
Linguistic approach Control approach			2.90**	2.30*
Sex-grouping approach Control approach			.41	.31

* Significant at .05 level
** Significant at .01 level

Sex Differences in Reading Achievement

A study was made of differences between means on the reading achievement tests for all boys versus those for all girls regardless of the treatment group to which each child was assigned. Means and F values for boys and for girls on the attitude and achievement tests are presented in Table 16.

It can be seen from a study of Table 16 that girls had significantly higher means than boys on tests of paragraph meaning, spelling, and word study. There were no significant differences between means for the test of attitude toward reading or for any of the oral reading tests.

Differences in Reading Achievement at Three Intelligence Levels

It was hypothesized from observations of the reading performances of the children in the three treatment groups, that the linguistic approach produced greater achievement for bright children than did the control approach, but that the control approach was better for children at the low end of the intelligence scale than was the linguistic approach. In order to test this hypothesis, a treatment by levels design was used to study achievement on the word reading, paragraph meaning, and spelling subtests of the Stanford Achievement Test. A 3 x 3 x 2 factorial design was used to study the three treatments at three intelligence levels for the two sexes. Table 17 contains the mean IQ for children assigned to each of the 18 cells in this experimental design.

Because intact groups were used in the experiment, and because factors such as sex and intelligence were specific to the subjects in the experiment and could not be assigned, the requirement of proportionality could not be met. It was necessary either to discard at random cases from some

TABLE 16

MEANS AND F VALUES ON ATTITUDE AND ACHIEVEMENT TESTS FOR BOYS VERSUS GIRLS

	Means		F Values (df 1,148)
	Boys	Girls	
Stanford Achievement Test			
Word Reading	24.4	25.3	3.30
Paragraph Meaning	23.4	26.5	18.29**
Vocabulary	24.8	24.2	1.50
Spelling	13.6	14.5	4.91*
Word Study	40.5	42.0	4.57*
San Diego Attitude Inventory	18.2	18.8	3.67
Gilmore Oral Reading Test			
Accuracy	2.99	3.32	3.09
Rate	54.8	57.4	.65
Fry Word List	12.4	13.8	.98
Gates Word List	16.4	18.1	1.99

* Significant at .05 level
** Significant at .01 level

of the cells until proportionality was satisfied or to use some modification of traditional analysis of variance procedures. Since discarding subjects would have tended to weaken the study, an unweighted cell means solution was used to compare the criterion means of the treatment groups.[1] The cell means in the three dimensional design were computed. These means were then

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[1] Winer, B. J. Statistical Principles in Experimental Design. McGraw-Hill New York, 1962, pp. 222-224, 241-244.

TABLE 17

MEAN IQ FOR EACH OF THREE ABILITY LEVELS USED IN TREATMENT BY LEVELS DESIGN

Group	Boys			Girls		
	High	Mid	Low	High	Mid	Low
Sex-grouping approach	119	103	90	120	103	91
Linguistic approach	118	104	88	120	103	89
Control approach	116	103	89	118	104	91

TABLE 18

SUMMARY TABLE OF ANALYSIS OF VARIANCE FOR THE WORD READING SUBTEST OF THE STANFORD ACHIEVEMENT TEST

Source	df	SS	MS	F
A (Treatments)	2	1951.6982	975.8491	27.63**
L (Intelligence)	2	4110.0474	2055.0237	58.19**
S (Sex)	1	25.4656	25.4656	<1.0
AL	4	21.6829	5.4207	<1.0
AS	2	133.5402	66.7701	1.89
LS	2	74.9803	37.4902	1.06
ALS	4	66.7503	16.6876	<1.0
Within	615	21717.5869	35.3131	

* Significant at .05 level
** Significant at .01 level

treated as single scores, and the 3 x 3 x 2 factorial design was analyzed as if it had only one score per cell. Each sum of squares was weighted by the harmonic mean of the cell n's. The regular within cells sum of squares remained the error term as in the usual factorial design. Tables 18, 19, and 20 contain the summary tables of analysis of variance produced by this procedure for the tests of word reading, paragraph meaning, and spelling.

A study of the summary tables for the analysis of variance on the three achievement measures leads to rejection of the hypothesis that any one treatment was effective at a low level of intelligence but not at a higher level or vice versa. There were no significant interactions observed for any of the three achievement measures.

TABLE 19

SUMMARY TABLE OF ANALYSIS OF VARIANCE FOR THE PARAGRAPH MEANING SUBTEST OF THE STANFORD ACHIEVEMENT TEST

Source	df	SS	MS	F
A (Treatments)	2	359.3211	179.6606	2.75
L (Intelligence)	2	7884.0986	3942.0493	60.42**
S (Sex)	1	780.2950	780.2950	11.96**
AL	4	257.7324	64.4331	<1.0
AS	2	101.8363	50.9182	<1.0
LS	2	131.6058	65.8029	1.0
ALS	4	64.3134	16.0784	<1.0
Within	615	40128,0000	65.2488	

* Significant at .05 level
**Significant at .01 level

TABLE 20

SUMMARY TABLE OF ANALYSIS OF VARIANCE FOR THE SPELLING SUBTEST OF THE STANFORD ACHIEVEMENT TEST

Source	df	SS	MS	F
A (Treatments)	2	250.3160	125.1580	5.27**
L (Intelligence)	2	2269.7130	1134.8565	47.76**
S (Sex)	1	30.5392	30.5392	1.29
AL	4	51.9410	12.9853	<1.0
AS	2	25.6284	12.8142	<1.0
LS	2	25.4673	12.7337	<1.0
ALS	4	37.5319	9.3830	<1.0
Within	615	14612.1000	23.7595	

* Significant at .05 level
**Significant at .01 level

The significant F values observed in the three summary tables indicated that:

1. There were significant differences among achievement test means for the low, the mid, and the high intelligence groups. As intelligence level varied, achievement level varied when treatment and sex were not considered. This was true for each of the three measures of achievement.

2. Girls had a significantly higher mean than boys on the test of paragraph meaning when treatment and intelligence levels were not considered. No such significant differences between means for the sexes were found for the tests of word reading and spelling.

3. There were significant differences among the means for the three treatment groups for word reading and for spelling when intelligence levels and sex were not considered. No such difference among treatment means was found for the test of paragraph meaning.

Since there were significant differences among means for treatment groups somewhere among intelligence levels and between sexes, F tests were run in order to locate the significant differences. Cell means and F values obtained in comparing pairs of means are recorded in Table 21.

Since there were also significant differences between means for the sexes somewhere among intelligence levels and treatments, F tests for pairs of means were made in order to locate the significant differences. Cell means and F values for this analysis are presented in Table 22.

A study of Table 21 leads to the conclusion that for word reading the linguistic approach was significantly better than the control approach for girls at all three intelligence levels and for boys at all three intelligence levels. The linguistic approach was also better than the sex-grouping approach for girls. The differences were significant for girls at the high and mid intelligence levels and approached significance for the low girls. For boys at the middle intelligence level, the linguistic approach was better for word reading than the sex-grouping approach but this was not true for boys at the other two intelligence levels. The sex-grouping approach was significantly better for high IQ boys than was the control approach on the variable of word reading.

On the spelling variable, significant differences among treatment means were found only at the high intelligence levels. The linguistic approach was significantly better than either of the other two approaches for bright girls and it was significantly better than the control approach for bright boys.

Although the analysis of the main effects of the treatments revealed no significant differences for paragraph meaning, the simple effects were

TABLE 21

COMPARISON OF TREATMENTS FOR BOYS AND FOR GIRLS AT THREE INTELLIGENCE LEVELS ON WORD READING, PARAGRAPH MEANING, AND SPELLING

	Boys			Girls		
	High	Mid	Low	High	Mid	Low
Word Reading Means						
Sex-grouping approach	27.7	24.2	21.5	26.8	23.9	20.3
Linguistic approach	29.6	27.6	23.5	31.6	26.8	24.2
Control approach	24.2	23.3	19.1	27.3	23.5	20.2
F Values						
Linguistic - Sex-grouping	2.20	5.16*	1.41	25.69**	4.05*	3.24
Linguistic - Control	15.85**	7.09**	7.02**	19.73**	8.43**	5.22*
Sex-grouping - Control	8.12**	.36	2.11	.20	.09	.00
Paragraph Meaning Means						
Sex-grouping approach	28.7	24.1	20.6	30.7	25.5	21.2
Linguistic approach	29.1	24.2	19.9	32.3	25.2	22.1
Control approach	24.3	23.5	18.2	30.0	26.3	19.9
F Values						
Linguistic - Sex-grouping	.03	.01	.11	1.40	.02	.10
Linguistic - Control	3.56	.09	.65	3.26	.36	.93
Sex-grouping - Control	4.17*	.08	1.21	.27	.22	.46
Spelling Means						
Sex-grouping approach	15.8	13.8	11.7	15.8	14.0	11.1
Linguistic approach	17.5	14.4	11.6	17.8	15.4	12.2
Control approach	14.1	13.2	11.3	16.2	14.2	10.8
F Values						
Linguistic - Sex-grouping	2.82	.26	.00	6.40*	1.81	.32
Linguistic - Control	7.19*	.74	.10	5.39*	1.74	.05
Sex-grouping - Control	2.49	.29	.06	.18	.04	.82

* Significant at .05 level
** Significant at .01 level

TABLE 22

COMPARISONS OF SEX GROUPS ASSIGNED TO TREATMENTS AT THREE INTELLIGENCE LEVELS ON WORD READING, PARAGRAPH MEANING, AND SPELLING

	Sex-grouping Approach	Linguistic Approach	Control Approach
WORD READING			
Means - High Boys	27.7	29.6	24.2
Means - High Girls	26.8	31.6	27.3
F Values	.67	3.62	5.97**
Means - Mid Boys	24.2	27.6	23.3
Means - Mid Girls	23.9	26.8	23.5
F Values	.05	.26	.02
Means - Low Boys	21.5	23.5	19.1
Means - Low Girls	20.3	24.2	20.2
F Values	.42	.12	.51
PARAGRAPH MEANING			
Means - High Boys	28.7	29.1	24.3
Means - High Girls	30.7	32.3	30.0
F Values	1.54	3.47	8.41**
Means - Mid Boys	24.1	24.2	23.5
Means - Mid Girls	25.5	25.2	26.3
F Values	.65	.22	2.38
Means - Low Boys	20.6	19.9	18.2
Means - Low Girls	21.2	22.1	19.9
F Values	.08	.77	.73
SPELLING			
Means - High Boys	15.8	17.5	14.1
Means - High Girls	15.8	17.8	16.2
F Values	.00	.11	3.97
Means - Mid Boys	13.8	14.4	13.2
Means - Mid Girls	14.0	15.4	14.2
F Values	.03	.71	.78
Means - Low Boys	11.7	11.6	11.3
Means - Low Girls	11.1	12.2	10.8
F Values	.13	.12	.13

* Significant at .05 level
** Significant at .01 level

studied and are reported in Table 21. It can be seen that F values found in comparing treatment means at the high intelligence levels approached significance and that in one instance the F value was large enough to be significant. The linguistic approach seemed better than the control approach for both boys and girls at the high IQ level and the sex-grouping approach was significantly better than the control approach for boys at the high intelligence level.

Table 22 presents an analysis of sex differences for the treatments at the three intelligence levels. A study of the table indicates that sex differences in achievement existed at the high intelligence level. Bright girls in the control group did significantly better than bright boys in the control group on the tests of paragraph meaning and word reading, and the difference on the test of spelling approached significance. The F values comparing means for bright boys with means for bright girls in the linguistic group on the factors of word reading and paragraph meaning approached significance with the girls having the higher means. Bright girls did not seem to have this advantage over bright boys in the sex-grouping approach.

Trends of scores for the 18 subgroups studied in the factorial design can be noted in the graphic presentation of means contained in Tables 23 and 24. In the first part of Table 23 the means for the control group are denoted by the letter C and the means for the linguistic group are denoted by the letter L. The magnitude of the differences between C and L means for the sexes at each intelligence level is indicated. The same data are presented for spelling in the first part of Table 24.

The second parts of Tables 23 and 24 indicate the magnitude of differences between means for the sex-grouping and the control approaches for the

TABLE 23

COMPARISON OF LINGUISTIC WITH CONTROL MEANS AND OF SEX-GROUPING WITH CONTROL MEANS FOR WORD READING AND PARAGRAPH MEANING AT THREE ABILITY LEVELS

```
                                              Raw Score Means
                        18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

WORD READING
  High Boys                                C----------------L**
  High Girls                                         C-----------L**

  Mid Boys                              C------------L**
  Mid Girls                              C--------L**

  Low Boys                  C------------L**
  Mid Girls                    C-----------L**

PARAGRAPH MEANING
  High Boys                                C--------------L
  High Girls                                                    C------L

  Mid Boys                               C-L
  Mid Girls                                   L--C

  Low Boys               C----L
  Low Girls                   C------L
WORD READING
  High Boys                                C---------S**
  High Girls                                          S-C

  Mid Boys                              C--S
  Mid Girls                              CS

  Low Boys                  C-----S
  Low Girls                   CS
PARAGRAPH MEANING
  High Boys                                C------------S**
  High Girls                                                   C-S

  Mid Boys                             CS
  Mid Girls                                   S-C

  Low Boys              C------S
  Low Girls                  C---S
```

C indicates Control Mean
L indicates Linguistic mean
S indicates Sex-grouping mean

* Significant difference at .05 level
**Significant difference at .01 level

TABLE 24

COMPARISON OF LINGUISTIC WITH CONTROL MEANS AND OF SEX GROUPING WITH CONTROL MEANS FOR SPELLING AT THREE ABILITY LEVELS

```
                                            Raw Score Means
                             10  11 12  13  14  15  16  17  18 19  20

SPELLING
   High Boys                                 C-------------L*
   High Girls                                        C------L*

   Mid Boys                               C----L
   Mid Girls                                  C----L

   Low Boys                        CL
   Low Girls                     C-----L

SPELLING
   High Boys                                 C------S
   High Girls                                      S-C

   Mid Boys                              C--S
   Mid Girls                                 SC

   Low Boys                       C-S
   Low Girls                     CS
```

C indicates Control mean
L indicates Linguistic mean
S indicates Sex-grouping mean

*Significant difference at .05 level
**Significant difference at .01 level

three achievement measures. The sex-grouping approach means are denoted by the letter S and the control approach means by the letter C.

In the comparison of control means with linguistic means it can be seen that the gaps between means are greater for bright boys than for bright girls. However, the means for bright girls in the linguistic group may have been somewhat depressed because the scores approached the upper limits of the test used to measure achievement. The quite large differences between control means for bright boys and for bright girls which can be seen in these tables lead to the hypothesis that the control approach penalized bright boys to some extent.

In looking at the comparisons of control means with sex-grouping means, it can be seen that the sex-grouping approach produced consistently higher means for boys than the control approach. Such was not the case for girls, as the control means were sometimes higher than the means for the sex-grouping approach.

Percentages of Children Reading Above and Below Grade Placement

Still another type of analysis of the differences in achievement produced by the three approaches is contained in Table 25. For the measures of silent reading comprehension and oral reading accuracy the percentages of children performing below, at, and above grade level have been indicated. Since the tests were administered at the end of the eighth month of the first year of school, the expected achievement for children of normal intelligence would be grade level 1.8. Disregarding the obvious discrepancies in the grade level norms between the two tests, it can be seen that none of the three approaches prevented failure in reading. The linguistic approach seemed to produce greater variability in achievement than the other two approaches. More children were found at the extremes within this approach, with a greater concentration of cases at the upper extreme than the lower extreme of the grade level scale.

Evaluation of Teacher Performance

The differences among the treatments favoring the linguistic approach could perhaps be attributed to greater teaching efficiency on the part of the teachers working with the linguistic approach. However, there were no indications of better preparation or more experience for teachers in this

TABLE 25

PERCENTAGES OF CHILDREN IN EACH TREATMENT GROUP READING BELOW, AT, AND ABOVE GRADE PLACEMENT

	Sex-Grouping Approach	Linguistic Approach	Control Approach
STANFORD ACHIEVEMENT TEST PARAGRAPH MEANING			
Grade Level 1.0 to 1.5	4.97	8.82	7.58
Grade Level 1.5 to 1.7	30.76	29.40	38.85
Grade Level 1.8 to 2.7	52.20	50.51	51.67
Grade Level 2.9 to 4.0	16.74	20.09	9.48
GILMORE ORAL READING TEST ACCURACY			
Grade Level 1.0 to 1.9	12	12	12
Grade Level 2.0 to 2.9	24	14	32
Grade Level 3.0 to 3.9	46	48	34
Grade Level 4.0+	18	26	22

group in the descriptive data collected about each group of teachers. Ratings of the individual teachers by the supervisors working with the research staff indicated no differences among the groups of teachers assigned to the three treatment groups. A further study of the comparability of the three groups of teachers is presented in Tables 26, 27, and 28.

The tables contain the mean IQ for each class within the treatment group being considered, the mean raw score on the paragraph meaning test, and the mean raw score on the attitude test. The rank of each of these means within the group of 10 means is also indicated. The rank-difference correlation

TABLE 26

RANK ORDER COMPARISONS OF CLASS MEANS FOR IQ, PARAGRAPH MEANING, AND ATTITUDE IN THE SEX-GROUPING APPROACH

Teacher	Class Mean IQ	Rank in Group	Class Mean Paragraph Meaning	Rank in Group	Class Mean Attitude Inventory	Rank in Group
A	114.65	1	31.35	1	18.41	7
B	113.65	2	27.59	4	16.59	9
C	111.75	3	23.85	8	18.90	4
D	106.92	4	27.52	5	18.96	3
E	104.86	5	25.36	7	18.64	5
F	103.52	6	28.93	2	19.93	1
G	102.90	7	27.30	6	19.80	2
H	101.83	8	22.80	9	15.96	10
I	101.60	9	28.08	3	18.58	6
J	99.43	10	12.52	10	17.24	8

coefficient between ranks for IQ and achievement on the paragraph meaning test was computed for each treatment group. A similar coefficient was computed between ranks for IQ and attitude and between ranks for achievement and attitude. The formula used in computing the correlations was

$$r' = 1 - \frac{6 \Sigma D^2}{n(n^2 - 1)} .$$

The correlation coefficients produced through use of the formula are presented in Table 29.

TABLE 27

RANK ORDER COMPARISONS OF CLASS MEANS FOR IQ, PARAGRAPH MEANING, AND ATTITUDE IN THE LINGUISTIC APPROACH

Teacher	Class Mean IQ	Rank in Group	Class Mean Paragraph Meaning	Rank in Group	Class Mean Attitude Inventory	Rank in Group
A	115.95	1	26.32	6	15.21	10
B	108.81	2	22.05	9	20.43	3
C	108.72	3	30.00	2	19.17	8
D	108.05	4	27.00	5	20.48	2
E	106.08	5	28.73	3	20.08	4
F	102.15	6	27.50	4	21.15	1
G	100.91	7	31.04	1	18.87	9
H	99.35	8	22.06	8	19.41	7
I	98.37	9	22.11	7	19.84	5.5
J	94.84	10	18.58	10	19.84	5.5

An inspection of Table 29 leads to the conclusion that there was a great deal of variability in performance among the teachers within the linguistic group. The correlation coefficient of .25 for this group meant that the teachers with the brightest groups were not necessarily those whose groups achieved the highest scores on the paragraph meaning test. There was also a great deal of variability in performance among the teachers within the sex-grouping approach. In the control approach variability was not so great, as each class rank for IQ differed little from its rank for achievement. Achievement in the control group seemed less dependent upon the

TABLE 28

RANK ORDER COMPARISONS OF CLASS MEANS FOR IQ, PARAGRAPH MEANING, AND ATTITUDE IN THE CONTROL APPROACH

Teacher	Class Mean IQ	Rank in Group	Class Mean Paragraph Meaning	Rank in Group	Class Mean Attitude Inventory	Rank in Group
A	107.35	1	27.10	2	17.95	6
B	106.39	2	30.83	1	19.28	1
C	105.68	3	25.05	5	14.84	10
D	104.87	4	24.37	6	18.04	5
E	104.04	5	26.85	3	16.78	9
F	103.12	6	21.15	8	18.38	4
G	102.79	7	26.32	4	18.84	3
H	100.95	8	22.18	7	19.27	2
I	96.95	9	20.85	9	17.10	8
J	90.13	10	12.07	10	17.27	7

TABLE 29

RANK-DIFFERENCE CORRELATION COEFFICIENTS FOR TREATMENT GROUPS BETWEEN IQ AND ACHIEVEMENT, IQ AND ATTITUDE, AND ACHIEVEMENT AND ATTITUDE

	IQ with Achievement	IQ with Attitude	Attitude with Achievement
Sex-grouping approach	.47	.07	.30
Linguistic approach	.25	-.05	-.17
Control approach	.83	.21	.04

teaching skill of the individual teacher than it did in the other two approaches.

The correlation coefficients between IQ and attitude toward reading and between attitude toward reading and achievement in reading are presented for the reader's perusal.

Evaluation of Children's Writing Abilities

The project directors of the 27 research centers agreed to obtain a sample composition from each child involved in the research studies. The intent was to assess the effect upon composition skills of methods of teaching which employed both reading and writing simultaneously. Since writing accompanied reading in the early stages of the linguistic approach used in the present study, analyses of compositions written by a sample of 50 children within each treatment group were made. Only the composition elicited by the restricted stimulus was studied for each child. The results of the analysis are reported in Table 30.

Four factors associated with ability to compose were studied. The four factors were the child's mastery of punctuation, capitalization, and paragraphing; spelling ability; fluency, which was measured as the number of words written in a 20 minute period; and the ability to write complex sentences, which was measured through use of a subordination index. Directions for computing the mechanics ratio, the spelling ratio, and story length are included in Appendix D. The subordination index was computed through use of the following formula:

$$\text{Subordination Index} = \frac{\text{Dependent Clauses}}{\text{Total Clauses}} \times 100.$$

TABLE 30

INTERGROUP COMPARISONS OF MASTERY OF CERTAIN ABILITIES NEEDED IN WRITING ORIGINAL COMPOSITIONS

	Mechanics Ratio	Spelling	Story Length	Subordination Index
Means				
Sex-grouping approach	66.9	.80	34.9	9
Linguistic approach	71.2	.81	39.6	8
Control approach	73.1	.83	34.4	7
F Values	1.42	.42	1.59	.19
$F_{.01}$ (df 2,147) = 4.78				
$F_{.05}$ (df 2,147) = 3.07				

The data in Table 30 indicate that there were no significant differences among means for the treatment groups for any of the four factors which were analyzed.

A summary of the conclusions drawn from this analysis and the other analyses contained in this chapter and the implications of those conclusions are presented in Chapter 5.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

Introduction

The primary purpose of the present study was to study sex differences in reading achievement under three different approaches to teaching reading at the first grade level. The three approaches studied were a linguistic approach, a basal reader approach with ability grouping, and an approach using basal readers with intra-class grouping based on sex as well as ability. A total of 30 teachers and 633 children in three elementary school districts were involved in the study.

The objective of the study was to test three hypotheses: (1) that boys will make higher scores on measures of reading achievement if they are introduced to reading through materials in which there is one sound to one letter than they will if they are introduced to reading through materials in which sound-symbol relationships are ignored: (2) that boys will make higher scores on measures of reading achievement if they are grouped by sex for instruction and if the rate and emphasis of instruction are adapted to their needs than they will if they are grouped by ability only with no attention given to sex differences, and, (3) that girls will make higher scores on measures of reading achievement under each of the approaches to be studied than will boys.

Conclusions

The first analysis of the data was concerned with finding differences among means for treatment groups. Both pre-test and post-test data for treatment groups were analyzed. The criterion for significance was the .05 level of confidence. The following conclusions were drawn:

1. There were no significant differences among means for the treatment groups on intelligence, as measured by the Pintner-Cunningham Test, or on chronological age.

2. A total of 22 children made scores of 10 or better on the Detroit Word Recognition Test administered at the beginning of the study. These 22 children, who were considered to have some reading ability before receiving instruction, were equally distributed across the three treatment groups.

3. There were no significant differences among means for treatment groups for attendance during the 140-day instructional period.

4. There were no significant differences among means for treatment groups on the total score for the Metropolitan Readiness Tests.

5. There were significant differences among means for treatment groups on the listening and matching subtests of the Metropolitan, on the Thurstone Identical Forms Test, and on the learning rate subtest of the Murphy-Durrell Diagnostic Readiness Test. The children in the sex-grouping approach had significantly higher means on the matching test and the Identical Forms test than either of the other two groups. The children in the linguistic approach had means significantly higher than those of the children in the control approach on the listening and learning rate tests.

6. There were no significant differences among means for treatment groups on the subtests of the Murphy-Durrell Test which measured phoneme discrimination and letter knowledge.

7. There were no significant differences among means for treatment groups for the paragraph meaning and vocabulary subtests of the Stanford Achievement Test which was administered at the end of the instructional period.

8. There were significant differences among means for treatment groups on the word reading, spelling, and word study subtests of the Stanford Achievement Test. The children in the linguistic approach had significantly higher means on these subtests than either of the other two groups. The children in the sex-grouping approach had a significantly higher mean on the word reading subtest than did the control group.

9. There were significant differences among means for the groups on the San Diego Reading Attitude Inventory. The children in the linguistic approach had a significantly higher mean than either of the other two groups.

10. There were no significant differences among means for treatment groups for the Gilmore Oral Reading Test which was administered to a sample of 50 children from each treatment group. No significant differences among means were found for either the measure of accuracy or for the measure of rate on the Gilmore test.

11. There were significant differences among means for the treatment groups on the two word-pronunciation tests which were administered to the subsample of 150 children. The children in the linguistic approach had significantly higher means than either of the other two groups on the Gates Word Pronunciation Test and the Fry Oral Test of Phonetically Regular Words.

In order to test the hypotheses that the two experimental approaches would lead to greater achievement among the boys, an analysis of the data for boys only was carried out. The following conclusions were drawn:

1. Differences among the means for boys assigned to each treatment group were found only on two subtests of the readiness tests administered at the beginning of the study. Boys in the linguistic approach had a significantly higher mean for the listening subtest of the Metropolitan than boys in the control approach. Boys in the sex-grouping approach had a significantly

higher mean than boys in the control approach for the Thurstone Identical Forms test. No significant differences among means for boys assigned to the three treatment groups were found for any other control variables.

2. No significant differences among means for boys assigned to the three treatment groups were found for the outcome variables of paragraph meaning, vocabulary, spelling, word study, oral reading accuracy, or oral reading rate.

3. Significant differences among means for boys assigned to the three treatment groups were found only for word reading on the Stanford Achievement Test and for the Fry Oral Test of Phonetically Regular Words. The boys in the linguistic group had significantly higher means on these two tests than the boys in either of the other two groups. The boys in the sex-grouping approach had a significantly higher mean on the word reading test than the boys in the control approach.

A similar analysis for the girls assigned to each treatment group was made. The following conclusions were drawn:

1. Significant differences among the means for girls assigned to each treatment group were found for the intelligence test, for the word meaning and matching subtests of the Metropolitan Readiness Test, for the Thurstone Identical Forms Test, and for the learning rate subtest of the Murphy-Durrell Readiness Test.

2. The girls in the sex-grouping approach had a significantly higher mean IQ than the girls in the control approach.

3. The girls in the sex-grouping approach had significantly higher means on the matching test and the Thurstone Identical Forms than the girls in either of the other two groups.

4. The girls in the linguistic approach had significantly higher means than the girls in the control group for the word meaning and learning rate tests.

5. On the Stanford Achievement test the girls in the linguistic group had significantly higher means than girls in either of the other two groups for the tests of word reading, spelling, and word study. There were no significant differences for the tests of paragraph meaning and vocabulary.

6. There were no significant differences among means for the girls assigned to each group on the Gilmore Oral Reading Test. There were significant differences favoring the linguistic approach over the other two approaches for the Gates Word Pronunciation Test and the Fry Oral Test of Phonetically Regular Words.

There were 291 boys and 342 girls in the total sample of 633 children. An analysis of pre-test and post-test scores was made for all males versus all females in the study. The following conclusions were drawn:

1. The boys in the study were older than the girls. The mean difference of 1.4 months was a significant difference.

2. The girls had a significantly higher mean than the boys on the Pintner-Cunningham intelligence test.

3. The means for girls on the alphabet subtest of the Metropolitan Readiness Tests and on the phonemes subtest of the Murphy-Durrell were significantly higher than those for boys.

4. The boys had a significantly higher mean on the test of word meaning than did girls.

5. Girls had significantly higher means than boys on the Stanford Achievement subtests measuring paragraph meaning, spelling, and word study. There were no other significant differences on the outcome variables.

A treatment by levels design was used to study the effects of the three treatments at three levels of intelligence for boys and girls. The mean IQ for children in the low intelligence level was 89, in the middle level 103, and in the high level 118. The three variables studied were the scores on the word reading, paragraph meaning, and spelling subtests of the Stanford Achievement Test. The following conclusions were drawn:

1. For word reading the linguistic approach produced significantly higher means than the control approach for both boys and girls at each of the intelligence levels.

2. For word reading, the linguistic approach produced significantly higher means than the sex-grouping approach for all ability groups except the boys at the high intelligence level.

3. For word reading, the sex-grouping approach produced a significantly higher mean than the control approach for boys at the high intelligence level. No other significant differences between means were found in comparing the sex-grouping approach with the control approach.

4. For paragraph meaning none of the differences between means were significant except those for boys at the high intelligence level. There, the mean for the sex-grouping approach was significantly higher than the mean for the control approach.

5. For spelling, the only significant differences among means for the three treatments occurred at the high intelligence level. The high IQ girls in the linguistic approach had a significantly greater mean than the high IQ girls in either of the other two approaches. The high IQ boys in the linguistic approach had a significantly higher mean than the high IQ boys in the control approach.

When sex differences were studied in this type of factorial design, the following conclusions were drawn:

1. The high IQ girls in the control approach had significantly higher means for word reading and paragraph meaning than the high IQ boys in the same approach. No other significant differences between means for boys and girls who received the same treatment were found at the high intelligence level, although the differences between means for boys and for girls within the linguistic group were large enough to approach significance.

2. Differences between means for the boys and the girls at the low and middle intelligence levels were all non-significant.

3. Although there were few significant differences between means for the sex-grouping approach and means for the control approach, the means for boys in the sex-grouping approach were higher at every level of intelligence and for each of the three variables than the means for boys in the control approach. This was not true for girls however, for the control means were sometimes higher for girls than the sex-grouping means.

The reading achievement tests were administered in the present study when the children were in the eighth month of the school year. A grade level of 1.8 was, therefore, the expected achievement level for the child making normal progress. The percentage of children reading below grade level 1.5 on the paragraph meaning subtest of the Stanford Achievement Test ranged from approximately 5 per cent for the sex-grouping approach to approximately 9 per cent for the linguistic approach. On the Gilmore Oral Reading Test approximately 12 per cent of the children in each group were reading below grade level 2.0. The percentage of children reading above grade level 2.9 on the test of paragraph meaning ranged from 9 per cent for the control group to 20 per cent for the linguistic group. On the Gilmore Oral Reading

Test the percentage of children reading above grade level 4.0 ranged from 18 per cent for the sex-grouping approach to 26 per cent for the linguistic group.

The rank-difference correlation coefficient between class ranks for IQ and for achievement on the paragraph meaning test was computed for each treatment group. The coefficients were .47 for the sex-grouping approach, .25 for the linguistic approach, and .83 for the control approach. Within the control approach each class rank for IQ differed little from its rank for achievement.

Compositions written by 50 children in each treatment group were analyzed for mastery of four aspects of writing. A mechanics ratio, a spelling ratio, a measure of story length, and an index of subordination were computed. There were no significant differences among means for the treatment groups for any of these four factors.

Implications

The major hypotheses of the study were that boys in the linguistic approach would read better than boys in the typical basal approach with ability grouping; that boys in the sex-grouping approach would read better than boys in the approach using only ability grouping; and that girls would read better than boys under each of the treatments. It must be concluded that neither of the experimental approaches was better than the control approach for boys for any reading skill except word reading. For word reading the linguistic approach was the best approach, the sex-grouping approach was next, and the control approach was least effective.

The hypothesis that girls would achieve higher scores than boys was true only for the test of paragraph meaning. Girls in each of the three approaches had significantly higher means than boys in the same approach on the test of paragraph meaning.

It would seem to the present writer that the test of paragraph meaning is the most comprehensive test of "reading ability" among the various subtests which were administered. However, it is possible that the ability to pronounce words in lists and to analyze words are abilities which lead to greater facility in "reading" at later grade levels. It is difficult, therefore, to accept or to reject categorically each of the three hypotheses. It can only be said that for children who have had one year of instruction in reading, the third hypothesis seems more adequately supported than the first two.

If one considers the effect of each of the treatments without considering the sex variable, the linguistic approach seemed to be the most effective of the three. On nearly every measure of achievement the linguistic approach produced higher means than the other two approaches. The means were significantly higher for tests involving word analysis and for the test of attitude toward reading. It must be remembered that these results were produced by a particular approach involving emphasis upon meaning and fluency as well as word analysis skills and that other "linguistic" approaches might not produce similar results. The superiority of the linguistic approach used in this study over the other two approaches was maintained despite the fact that measures of readiness to read indicated that the children in the linguistic approach were in no instance superior to those in the sex-grouping approach and were superior to those in the control group only on general listening ability and ability to learn and remember word forms.

The sex-grouping approach seemed more effective for boys than the control approach. The advantage was small but consistent in favor of the sex-grouping approach. For girls, however, the sex-grouping approach seemed detrimental. Girls in the sex-grouping approach sometimes had lower scores on the achievement tests than girls in the control approach. This was true despite the fact that girls in the sex-grouping approach had a significantly higher mean IQ and significantly higher scores on some of the readiness tests. It seems that female teachers were able to adapt their instructional procedures to meet the needs of boys and to praise and reward them, but that in doing so they neglected the girls somewhat.

It appeared in the present study that the three approaches were about equally effective with children at the low and middle intelligence levels. Children at the high intelligence level seemed to be most affected by the method used. For girls at this intelligence level, the linguistic approach was the most effective. For boys at the high intelligence level, anything seemed better than the control approach. The use of basal readers with ability grouping seemed to penalize the bright boys considerably. There seemed to be no clearcut advantage for the linguistic approach over the sex-grouping approach for these boys. It may have been that both were effective because both emphasized sound symbol relationships to a greater extent than the control approach did. The bright boys in the sex-grouping approach used the Houghton-Mifflin readers in which there was somewhat greater emphasis on the use of letter-sound relationships in attacking words than there was in the other readers used in the sex-grouping and control approaches.

None of the three approaches to teaching reading seemed to prevent reading failure. The linguistic approach seemed to produce greater variability in achievement than the other two approaches, largely by increasing achievement among the bright children.

There was apparently little variability in performance among the teachers in the control group, as each class rank for IQ differed little from its rank for achievement. There was a great deal of variability in performance among the teachers in the linguistic approach and among the teachers in the sex-grouping approach. Achievement in the control group seemed less dependent upon the teaching skill of the individual teacher than it did in the other two approaches. Despite this fact, the achievement of the children in the control approach did not match that of the children in the linguistic approach.

Girls seemed better equipped for reading at the beginning of the instructional period than boys, and this advantage was maintained in the studies of achievement made at the end of the year. The reading achievement lag of boys seemed to depend upon something other than the teaching method used after children entered formal reading instruction in the first grade.

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APPENDIX A

List of Materials Used in the Sex-Grouping Approach

READING TEXTBOOKS

Each teacher should have the following materials in the classroom:

1. Readiness materials

30 copies -- Getting Ready to Read -- Houghton-Mifflin
30 copies -- Learning Letter Sounds -- Houghton-Mifflin
1 set -- plastic objects -- Houghton-Mifflin
1 set -- 22 boxes -- Houghton-Mifflin
1 set -- picture key cards -- Houghton-Mifflin
1 set -- Letto cards -- Houghton-Mifflin
15 copies -- Before We Read -- Scott, Foresman

The Houghton-Mifflin materials are to be used with all the children at the beginning of the year. Since girls are to use the Scott, Foresman readers, the Scott, Foresman readiness book may be used with the girls as soon as groups are formed.

2. Basal and supplementary texts and workbooks

For Boys:

15 copies -- Tip -- Houghton-Mifflin
15 copies -- Tip and Mitten -- Houghton-Mifflin
15 copies -- The Big Show -- Houghton-Mifflin
20 copies -- Workbook for Pre-Primers -- Houghton-Mifflin
15 copies -- Jack and Janet -- Houghton-Mifflin
20 copies -- Workbook for Jack and Janet -- Houghton-Mifflin
15 copies -- Up and Away -- Houghton-Mifflin
Teacher's editions of each of the above

10 copies -- My Little Red Story Book -- Ginn
10 copies -- My Little Green Story Book -- Ginn
10 copies -- My Little Blue Story Book -- Ginn
10 copies -- Workbook for Pre-Primers -- Ginn
10 copies -- The Little White House -- Ginn
10 copies -- Workbook for The Little White House -- Ginn
10 copies -- On Cherry Street
Teacher's editions of each of the above

10 copies -- Secret Places (PP) -- Steck
10 copies -- Every Day a Surprise (P) -- Steck
10 copies -- Did You Ever? -- Steck
10 copies -- Story Wagon (P) -- Singer
10 copies -- Story Time -- Singer
10 copies -- Merry-Go-Round (L) -- Merrill

Houghton-Mifflin is to be the basal series for the bright group of boys. Either Houghton-Mifflin or Ginn may be used as the basal series for the other boys' group or groups.

For Girls:

15 copies -- Sally, Dick and Jane -- Scott, Foresman
15 copies -- Fun with Our Family -- Scott, Foresman
15 copies -- Fun Wherever We Are -- Scott, Foresman
20 copies -- Workbook for Pre-Primers -- Scott, Foresman
15 copies -- Fun With Our Friends -- Scott, Foresman
20 copies -- Workbook for Fun With Our Friends -- Scott, Foresman
15 copies -- More Fun With Our Friends -- Scott, Foresman

Supplementary books for girls may be chosen from series from any of the following publishers:

Winston
Row, Peterson (where this series is not used for remedial work later)
Laidlaw
Lyons and Carnahan
American (where this series is not used for remedial work later)

TRADE BOOKS DEALING WITH TOPICS OF INTEREST TO BOYS

One copy of each of the following trade books was placed in each of the 10 classrooms involved in the sex-grouping approach:

Science

Henrietta Bancroft. Down Came Leaves. Crowell Company, New York.
Henrietta Bancroft. Animals in Winter. Crowell Company, New York.
Franklyn Branley. What Makes Day and Night. Crowell Company, New York.
Franklyn Branley. Air Is All Around You. Crowell Company, New York.
Roma Gans. The Wonder of Stone. Crowell Company, New York.
Millicent Selsam. Greg's Microscope. Harper Row, New York.
Rose Wyler and Gerald Ames. Prove It! Harper Row, New York.
Jeanne Bendick. All Around You. McGraw-Hill, New York.
Aliki. My Five Senses. Crowell Company, New York.

Space

Jeanne Bendick. The First Book of Space. Franklin Watts, Inc., New York.
Franklyn Branley. A Book of Astronauts for You. Crowell Company, New York
Franklyn Branley. A Book of Planets for You. Crowell Company, New York.
Mae and Ira Freeman. You Will Go to the Moon. Random House, New York.

Animals

Lorna Balian. An Elephant? Abingdon Press, Nashville, Tennessee.
Jean Bethell. Barney Beagle Plays Baseball. Grosset & Dunlap, New York.
James Ertel. Adventures of a Squirrel. Encyclopedia Britannica Press, Chicago.
Syd Hoff. Grizzwold. Harper Row, New York.
H. A. Rey. Curious George Learns the Alphabet. Houghton-Mifflin, New York
Miriam Schein. The Big Green Thing. Grosset & Dunlap, New York.
Elizabeth Stewart and Marlin Perkins. The Lion Twins, Atheneum Press, New York.

Jane Thayer. *Andy and the Runaway Horse.* William Morrow Company, New York.
Helen Palmer. *A Fish Out of Water.* Random House, New York.
Walter Farley. *Little Black, a Pony.* Random House, New York.
Lee Kingman. *Peter's Pony.* Doubleday Company, New York.
Robert Lopshire. *Put Me in the Zoo.* Random House, New York.

Male Characters

Carol Amescua. *Pablo, Boy of Mexico.* Encyclopedia Britannica Press, Chicago.
Peter Benchley. *Jonathan Visits the White House.* McGraw-Hill, New York.
Joan Lexau. *Olaf Is Late.* Dial Press, New York.
Emma Brock. *One Little Indian Boy.* Alfred Knopf, Inc., New York.
Jerrold Beim. *Smallest Boy in the Class.* William Morrow Co., New York.
Claire Hutchet Bishop. *Five Chinese Brothers.* Coward-McCann, New York.
Jean Bethell. *The Clumsy Cowboy.* Grosset & Dunlap, New York.
Dr. Seuss. *Hop on Pop.* Random House, New York.
Elsa Beskow. *Pelee's New Suit.* Harper Row, New York.
Carla Green. *Doctors and Nurses, What Do They Do?* Harper Row, New York.
Carla Green. *Soldiers and Sailors, What Do They Do?* Harper Row, New York.

Miscellaneous

Crosby Bonsall. *The Case of the Hungry Stranger.* Harper Row, New York.
Mildred Myrick. *The Secret Three.* Harper Row, New York.
Margaret Farquhar. *Colonial Life in America.* Holt, Rinehart and Winston, New York.
Brooks Smith and Robert Meredith. *The Coming of the Pilgrims.* Little, Brown and Company, Boston.
Doris Adelburg. *Grandma's Holidays.* Dial Press, New York.
Jonathan Peter. *Jokes and Riddles.* Grosset & Dunlap, New York.
Jonathan Peter. *More Jokes and Riddles.* Grosset & Dunlap, New York.
Ruth Sawyer. *Journey Cake, Ho.* Viking Press, New York.
Janice and Stanley Berenstain. *The Big Honey Hunt.* Random House, New York
Lorraine and Jerrold Beim. *Little Igloo.* Harcourt, Brace & World, New York.
Marcia Brown. *Stone Soup.* Scribners, New York.

OPTIONAL GAMES AND SUPPLEMENTARY TEACHING AIDS

Objects That Rhyme
Consonant Pictures for Peg Board
Vowel Pictures for Peg Board
Rhyming Pictures for Peg Board
Instructo Illustrated Verbs
Magic Cards
Magic Cards -- Blends and Digraphs
Picture Words for Beginners
Link Letters
Nifty Sentence Strips
Jigsaw Puzzles
Picture Word Builder
A B C Game
Rainbow Word Builders
Junior Phonic Rummy
Who Gets It?
Match, Set I
Match, Set II
Plastic Envelopes for Magic Cards
Nifty Chart Tablets
Magic Markers
Nifty Flannel Chart Board

APPENDIX B

Syllabus and Description of Procedures Used in the Linguistic Approach

TEXTBOOKS[**]

Diack, Hunter and Daniels, J. C. The Royal Road Readers. Chatto and Windus, Ltd., 40-42 William IV Street, London, W.C. 2, 1960.

Book One, Part I[**]
First Companion Books
Question Time Book I
Book I, Part II
Miniatures
Question Time, Book II
Book Two A
Second Companion Books
Question Time Book 3
Book Three A
Third Companion Books
Question Time Book 4
Book 4
Book 5
Book 6
Book 7
Book 8
Book 9
Teacher's Manual

Stratemeyer, Clara and Smith, Henry Lee, Jr. The Linguistic-Science Readers. Harper and Row, Evanston, Illinois, 1963.

Frog Fun[**]
Tuggy[**]
Pepper[**]

McCracken, Glenn and Walcutt, Charles C. Basic Reading. J. B. Lippincott Company, New York, 1963.

Pre-primer
Pre-primer Workbook
Primer[**]
Primer Workbook
Reader 1-1[**]
Reader 1-1 Workbook
Reader 1-2[**]
Reader 1-2 Workbook
Reader 2-1
Teacher's Manuals

Ten copies of Getting Ready to Read published by Houghton-Mifflin were provided for each classroom to be used as supplementary materials for children who were not able to enter the formal reading program at the beginning of the instructional period.

[**] Used as basal reading material.

SYLLABUS

The first reading sessions should be used to present the whole words and sentences found on pages 2 through 10 of Book I, Part I, of the Royal Road Readers. After the completion of page 10 of the Royal Road Reader, Book I, Part I, the schedule outlined below will be followed.
Key: RR - Royal Road, L - Lippincott, LM - Lippincott Manual

Sound	Basal	Worksheet	Special Words	Supplementary Manual	Supplementary Workbook	Practice Reading
t	RR-11,12 L-14PP		to	L-32-34	L-41PP	
f	RR-11,12 L-20PP		put	L-40-41	L-47, 51PP	
b	RR-13,14 L-21P			L-81	L-14,15P	
n	RR-13,14 L-7PP			L-19	L-25,26,27PP	
d	RR-15 L-11PP			L-27	L-37,38,39PP	
g	PP-15 L-18PP			L-37	L-45,46PP	
a	RR-16 L-1	Worksheet 1 and 2 LM-3,4		L-1	L-2,3,4PP	
i	RR-16 L-3			L-7	L-10PP	
o	RR-17 L-4			L-10	L-14PP	
u	RR-18			L-13	L-17,18PP	
					L-19PP	
e	RR-19 L-2	Worksheet 3 and 4 LM-6,9		L-4	L-6,7,8PP	
					L-12,15,16PP	
s	RR-20,21 L-10			L-25	L-33,34,35PP	
	RR-22		the a			

Sound	Basal	Worksheet	Special Words	Supplementary Manual	Supplementary Workbook	Practice Reading
m	RR-25 L-6	Worksheet 5 LM-19		L-16,17,18	L-21 L-22,23,24 L-28PP	
r	RR-25 L-8			L-22,23,24	L-29,30PP	
					L-31,32,36,40 43,44,48,49PP	
						L-9,13,15,17,19, 21,23,25PP
f	RR-25 L-30		for	L-51,52	L-57,58PP	
h	RR-26 L-28	Worksheet 6 LM-51		L-49,50	L-55PP	
w	RR-26 L-7P			L-66,67,78	L-6P	
l	RR-26 L-14P	Worksheet 7 LM-77		L-74,75,76, 77,78	L-11,13P 16P	L-16P
c (hard)	RR-27 L-26PP			L-47,48	L-53PP	
					L-54,56,59,60 62,63PP,12P	L-27,29,31,33PP
k	RR-27 L-24P			L-85,86	L-19,20P	First Companion Books
j	RR-27 L-68P			L-129-130	L-52P	First Companion Books
v	RR-27 L-73			L-133,134, 135	L-56P	First Companion Books
ck	RR-28 L-26P			L-87	L-21P	First Companion Books
x	RR-28 L-18 (1-1)					First Companion Books

Sound	Basal	Worksheet	Special Words	Supplementary Manual	Supplementary Workbook	Practice Reading
ng	RR-29 L-26 (1-1)					First Companion Books
ed	RR-29 L-6P omit ar					First Companion Books
wh	RR-30 L-14 (1-1)		List I Dolch words			First Companion Books
						Question time Book I
z	L-20 (1-1)					
			little			Frog Fun
ar	L-1p		are	L-61,62	L-1p L-2,3P	L-2P
er	L-5P		said,was saw,her	L-64,65	L-4,5P	L-8P
					L-7,10,17,18, 22,23,24,25, 26P	
ee	L-36P		been	L-36	L-29P	
y final	L-64 (1-1)					
			into			Tuggy
ch	L-5 (1-1)				L-6(1-1) (Oral)	
th	L-8(1-1)					
			he,she			Pepper
ow	L-12P			L-72	L-9P	L-12
						L-17,22,25,27, 29
ū ār	L-31P			L-92,93,94	L-27,28P	L-33,37

Sound	Basal	Worksheet	Special Words	Supplementary Manual	Supplementary Workbook	Practice Reading
ea	L-40P		I	L-100,101, 102	L-30,31P	L-41
ai	L-44P		my	L-104,105, 106	L-32,33P	L-46
Ī	L-50P			L-110,111, 112,113	L-34,35,36P	
$\overline{\text{ir}}$ ire	L-51P			L-113,114	L-37,38	L-51
ō	L-57P			L-117,118	L-41-42P,39P	
$\overline{\text{or}}$ ore	L-58P			L-118,119	L-43,44,45P L-40,46	L-59,60
oa oe	L-64P		does once	L-124,125	L-48,49P	L-65
			wolf		L-47,50,51,54, 55,57,58,59, 60,61,62,63P	L-69,74
			List 2 Dolch words			
Lippincott 1-1			List 3 Dolch words		Trade Books Royal Road: Book I, Part II, Miniatures Question Time Book 2 Book Two A Second Companion Books Question Time Book 3	
Lippincott 1-2			List 4 Dolch words		Trade Books Royal Road: Book Three A Third Companion Books Question Time Book 4 Book 4 Book 5	
Lippincott 2					Trade Books Royal Road: Books 6,7,8,9	

Dolch
Basic Sight Vocabulary

List I

a
am
an
and
as
ask
at
best
big
black
but
can
cut
did
drink
fast
from
get

got
had
help
has
him
his
hot
if
in
is
it
its
jump
just
let
little
long
must
not
pick

put
off
ran
red
run
seven
sing
sit
six
stop
tell
ten
the
up
us
upon
well
went
when
will

List 2

after
are
ate
be
been
before
better
bring
brown
both
came
carry
clean
cold
come
does
don't
down
eat
every
far
find
first
five
for
funny
gave
go
going
green
he
hold
into
keep
kind
like
made
make
me
much
my
myself
never
no
now

old
open
or
over
please
pretty
read
ride
said
saw
see
she
sleep
so
some
start
take
thank
that
these
think
this
those
three
to
under
very
was
warn

List 3

about
all
around
away
by
call
could
fall
fly
found
four
good
grow
hurt
look
may
one
only
out
own
play
say
shall
show
small
soon
they
today
together
too
try
two
yellow
yes
you
your
which
why
wish
work
would

List 4

because
blue
draw
eight
know
light
new
right
use

Irregularly spelled words on Dolch list

again
any
always
buy
do
done
full
give
goes
have
here
laugh
live
many
pull
of
once
their
there
walk
want
wash
what
where
who

DESCRIPTION OF PROCEDURES USED IN THE LINGUISTIC APPROACH

I. The instructional period began with the use of Book I of the Royal Road Readers. The first ten pages of the book presented whole words accompanied by pictures which gave the meanings of the words. The child matched word cards with pictures until he was able to distinguish the words one from another. The words were not split up into their component sounds by the teacher, but the child's attention was forced to the order of letters within the words because the words had no distinctive configurations which the child could remember.

Few of the children in the experiment experienced any problems in mastering this first step although the less able children required more time for mastery.

II. The second learning task for the children was presented in pages 11 through 19 of Book I of the Royal Road Readers. In this section the child was taught that letters stand for sounds. The consonants t, p, b, n, d and g were introduced in words whose meanings were presented through the use of illustrations. The child listened to the positions of these sounds in words pronounced by the teacher and then noted the position of the grapheme used to represent the sound in the written word. The child was required to write the letter in either the initial or final position in order to complete a word which he could produce orally to accompany the picture. The child followed the same procedures in learning the short sounds of the vowels. In each case the vowel was presented as the medial letter in a three letter word.

Supplementary exercises requiring the child to hear the order of sounds and identify the position of the sounds being studied were provided through worksheets produced by the teacher and through pages from the Lippincott workbook for the pre-primer level. Teacher-devised games and picture reference charts were also used. The Houghton-Mifflin readiness book, Getting Ready to Read, was available for use with children who needed additional work in hearing sounds. Even so, very immature children in one classroom were unable to master this task. The teacher used records which developed auditory discrimination and oral stories to dramatize and fix the associations between consonant sounds and the letters used to represent them.

Teachers were instructed to be very careful to refrain from producing the sounds in isolation while teaching these pages. Sounds were always to be identified by the teacher with such phrases as: "the sound you hear at the beginning of the word top" or "the sound of the letter t" (using the letter name).

It was noted by several of the teachers that children sometimes isolated the sounds for themselves in trying to solve some of the words even though the teacher had not done so. It is not known whether such isolated sounding was learned outside the school environment or whether it was something the child hit upon for himself in his attempts to deal with the problems presented to him.

In these pages the teachers were cautioned not to attempt to get the children to recognize the words themselves by sight. The point was to use the words to teach the sound-letter correspondences -- not to build sight vocabulary.

III. Page 20 of Book I of the Royal Road Readers presented the letter s in the same fashion as the previous letters had been presented. However, a new task for the pupil was presented on this page in that a list of words unaccompanied by pictures was given at the bottom of the page. The words were composed of letters which the child had already studied; however, the task was a new one for the child. Prior to meeting this list of words, the child had been listening for the position of a sound in a word and then recording the sound in the written form of the word by writing in a letter. In order to pronounce the listed words, the child had to look at the letter and think of the sound -- a reverse procedure to that which he had been following previously. In addition, the child had to retain several sounds and then blend them into a word with no picture or context clues to aid him.

The teachers reported that this task caused great difficulty for many of the children. It was suggested in group meetings that teachers not require all children to master this task, but that they begin the process of producing the sound from the letter by exercises in which only one letter at a time was changed within a known word. For example, the teacher would put the word top on the board and tell the children how to pronounce it if no one was able to figure it out. Then the teacher would erase the o and substitute an a to make the word tap and ask children what the new word would be. The word might then be changed to nap or tan so that the child would practice substituting known letter-sounds in various positions in a word. In addition, it was suggested that the children write a word from dictation and then change a letter of the word to make a new word given by the teacher.

This type of work was to proceed as the teacher continued to present other pages in the book.

IV. Page 21 also presented a task which had not been presented before in the text itself. On this page the child was required to supply two or three letters to finish a known word rather than only one letter.

Not all the children were able to, nor were required to master this task at the time as they were working with the less difficult task described above.

V. Pages 22, 23, and 24 of Book I presented sentences to be matched with pictures. The sentences were composed of words spelled with only the letters already studied by the children. Thus, theoretically, the child would be able to produce the words in each sentence.

The instructional procedure used by many of the teachers with their top groups in reading these pages was that of having the children try to read the sentences orally in turn until they could read them fluently. They reported that the children had some difficulty with this task. It was suggested that the children not be required to read for oral fluency, but that they read for meaning. When the *group* working together had decided which pictures and sentences belonged together, the page could be considered completed. Teachers were advised to help the children to use context in figuring out the matches which were to be made.

VI. Pages 25 and 26 added the sounds of *f*, *n*, *r*, *h*, *l*, and *w* to the child's repertoire. However, no instructional materials were presented other than words containing these sounds presented in sentences. The teachers spent several days teaching each of the sounds in the same manner that they had taught the sounds presented earlier; however, they had to produce their own instructional materials and use those presented in the Lippincott workbooks. The major part of each page in the *Royal Road Book I* was devoted to pictures and sentences which were to be matched. Teachers were advised to work out these problems with the group again and not to strive for oral fluency on the part of each child in reading these sentences.

VII. Pages 27, 28, and 29 again presented sentences to be matched with pictures, but on these pages the sentences contained some polysyllabic words. No directions were given to the teacher in the book itself to help her in dealing with accent and unstressed vowel sounds. Teachers were advised to use these pages as group puzzles and to tell the children the correct pronunciation of polysyllabic words where there was confusion. The sentences on these pages contained words in which the new sounds represented by c, k, v, j, x, and ck were used. Therefore, teachers were required to spend several days using supplementary materials in teaching these sounds before the picture and sentence matching could be completed.

As these activities were going on, the teachers continued the work with substitution of letters in words so that the child had to produce a sound from a letter on some occasions and a letter from a sound on other occasions.

Some teachers indicated that after considerable practice with this kind of sound substitution, some children still had great difficulty in applying their letter-sound knowledge in working out new words. The teachers were advised to move these students into the Harper Row Linguistic-Science Readers immediately so that they could meet the sounds many times in words used in context.

At this point each teacher was asked to review the techniques which she had been using with the slow-learning pupils who were having such difficulty in grasping and transferring the sound-symbol associations. The teachers often reverted to isolated sounding as an aid in working with these children, even though they had been asked to refrain from using such a procedure. Four teachers indicated that they did not isolate sounds, but that they slowed the normal tempo of sound production within a word so that the children could hear the component sounds more easily. Two teachers used isolated sounding for very brief periods with the low groups. Two teachers used isolated sounding regularly with the low group, while one used sounding and blending procedures with all of her reading groups.

VIII. Page 30 of Book 1 of the Royal Road Reader introduced still another new task for the child. The ed ending with its three variant sounds was introduced. This represented the first time the child had been required to deal with a letter symbol which could represent variant sounds. The teachers were advised to have the children say the root word and then say its past tense before they tried to read the root with the suffix added. In this way, oral context gave the child the correct pronunciation for the ed ending.

IX. As they neared the completion of Book I of the Royal Road Readers the children were given the First Companion Books of the Royal Road Readers to read as supplementary material. The common procedure followed by the teachers was that of giving the books to the children to be read silently at their desks and then having the books read orally in the reading groups. Some children did not read all of these stories.

X. After the completion of (but, in some cases, not mastery of) the materials presented in Book I of the Royal Road Readers all children read the three pre-primers of the Harper Row Linguistic-Science Readers. These pre-primers contained words spelled with the sounds which the child had already studied (with the exception of the sounds represented by ar, er, ee, y (final), ch, and th). Lippincott workbook pages were available as practice materials in hearing and writing these new sound-letter correspondences. The purposes to be attained through the use of these materials were the development of oral fluency and the development of comprehension. Use of context clues was to be stressed. Many repetitions of the regularly spelled words used in these books were provided through the stories included. Teachers were advised to urge children to use their letter knowledge in working out these words, but also to encourage rapid recognition of these words through the use of sight drills. This technique was especially recommended for those students who had great difficulty with transferring and blending letter-sounds.

Teachers reported that the students enjoyed the story materials in the pre-primers and that they had little difficulty with reading them. It was noted by some teachers that their brighter students developed a tendency to guess from context in reading these materials rather than take the time to read through the word letter by letter, although they could read through the words if they were held to accurate pronunciation by the teacher.

XI. Upon completion of the Harper Row Linguistic-Science Readers, the children were asked to read the Lippincott pre-primer. Most of the sounds presented in the pre-primer had already been mastered by the children, so the pages involving sentences or stories were read quickly. In the teaching of pages involving new sounds, teachers were to follow the instructions in the Lippincott manual. Teachers were advised not to require sight mastery of all words presented in the stories in the Lippincott pre-primer, primer, and first reader, but to work for speed recognition of words included in the Dolch Basic Sight Vocabulary list if they appeared in the Lippincott stories. Children were to be taught to use their letter-sound knowledge to attack Dolch words when they first appeared and to use it as a method of helping themselves out of difficulties with recognition of these words if such difficulties should occur. All other new words in the Lippincott materials were to be sounded out, but the teachers were advised to refrain from working for speed of recognition of words not on the Dolch high frequency list. The word lists included on some pages of the Lippincott materials were not to be read in their entirety by all students. Only advanced pupils were expected to read all of the words in such lists and they were not always required to do so.

Some children in three of the classrooms read all the books in the Royal Road Readers series and all the first grade books in the Lippincott basal series. They were given the second-grade level-one Lippincott reader to use as a text near the end of the experimental period. This reader reviewed the phonic presentation of the grade one materials in exactly the same order, with no new spelling patterns being presented.

APPENDIX C

Readiness, Attitude, and Achievement Tests

DETROIT WORD RECOGNITION TEST

By Eliza F. Oglesby, A.M.

Formerly Assistant Supervisor of Reading
Detroit, Michigan

EXAMINATION: FORM B

For Primary Grades

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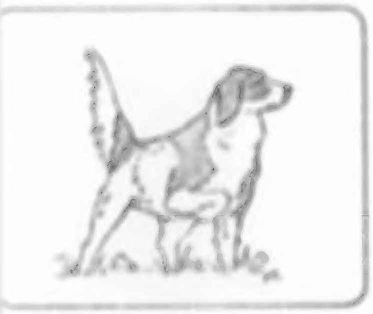
ame .... Score ....
(First name, initial, and last name)

ge last birthday .... years .... months

rade .... Teacher ....

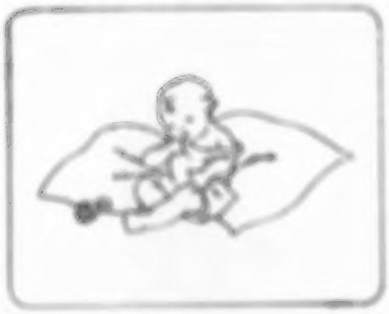
chool ....

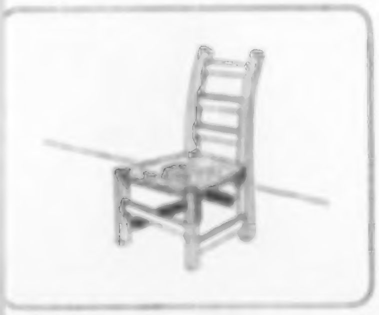
ity .... Date ....



chair

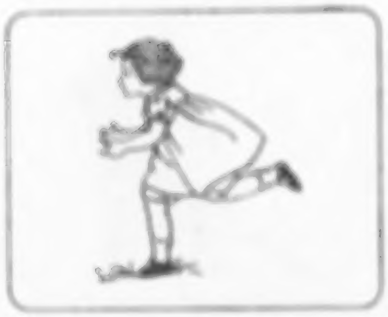
baby

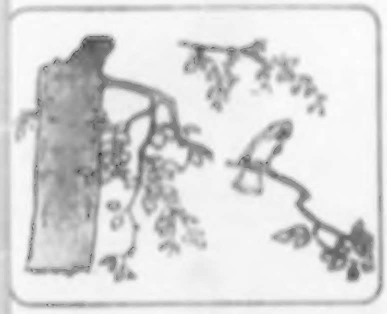




dog

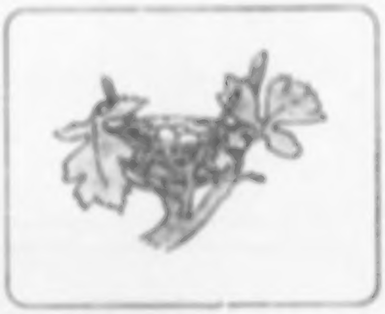
nest





a girl running

a bird in a tree



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[illegible] PRINTED IN U.S.A.

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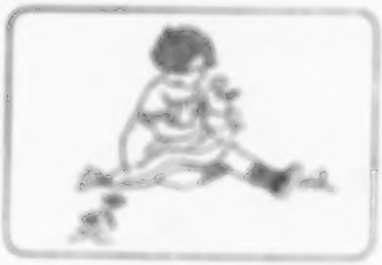
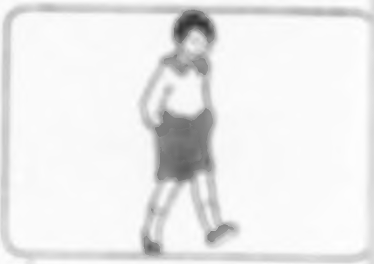
Word Rec. Time:





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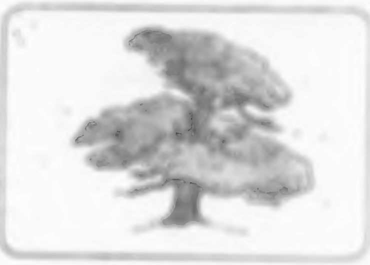
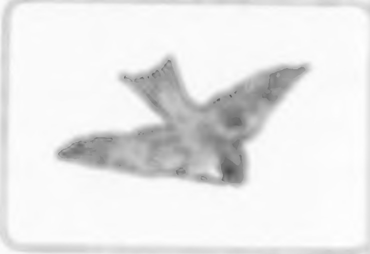
tree

____________________ 1

boy

____________________ 2



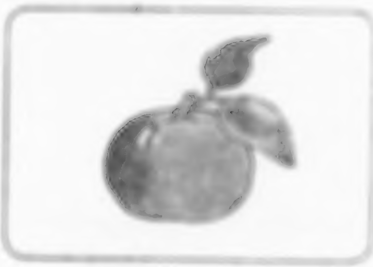


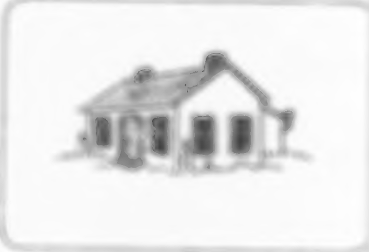
girl

____________________ 3

apple

____________________ 4



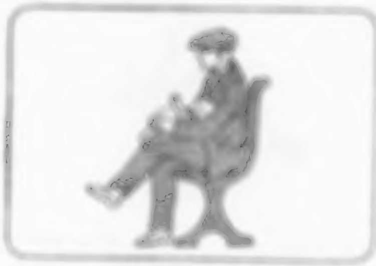


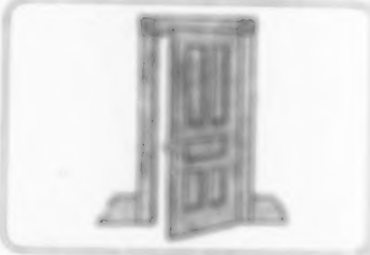
mother

____________________ 5

king

____________________ 6



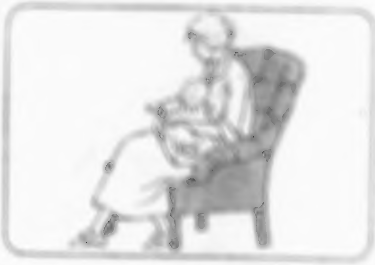


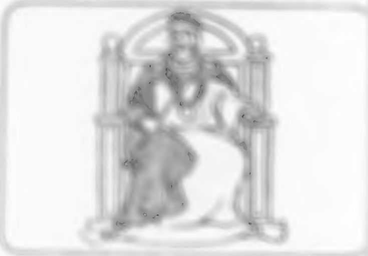
bird

____________________ 7

house

____________________ 8



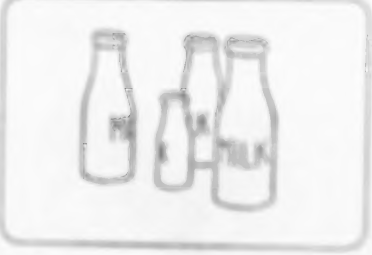


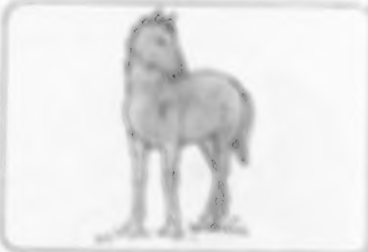
father

____________________ 9

door

____________________ 10


MILK
MILK
MILK

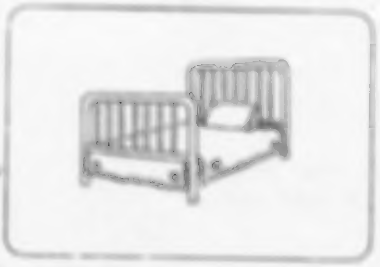


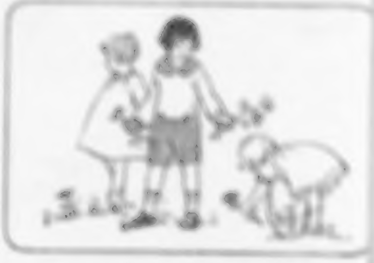
children

____________________ 11

bed

____________________ 12



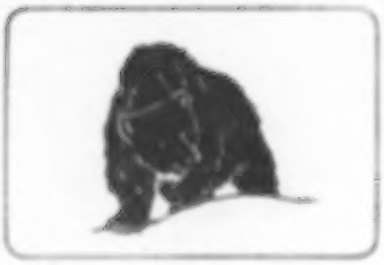


milk

____________________ 13

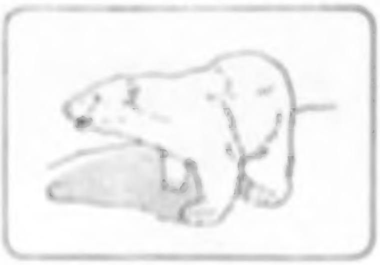
horse

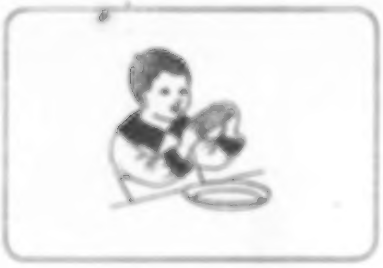
____________________ 14



some boys and girls 15

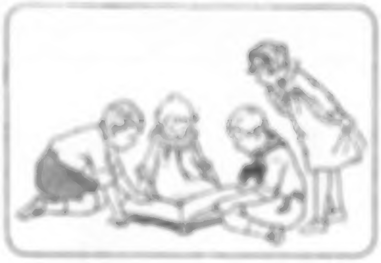
a black bear 16

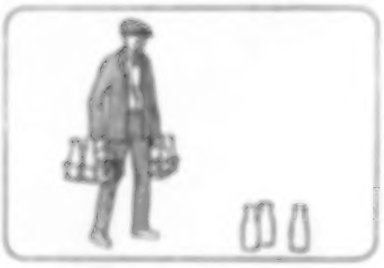




a white bear 17

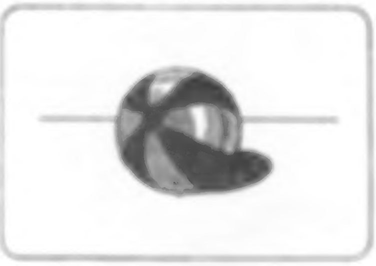
one big ball 18

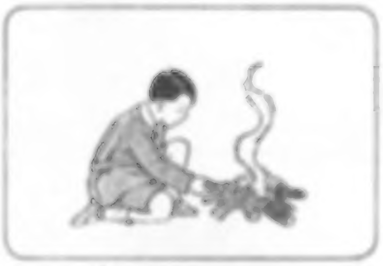




two little balls 19

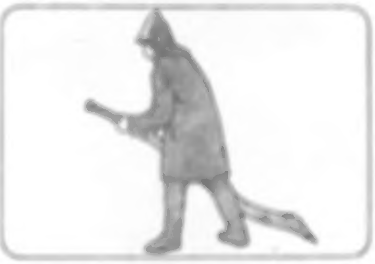
a can of corn 20

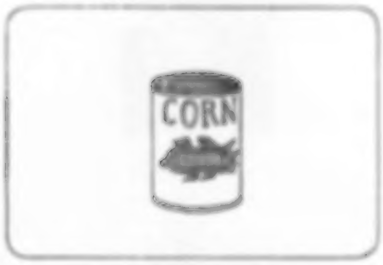




a boy eating corn 21

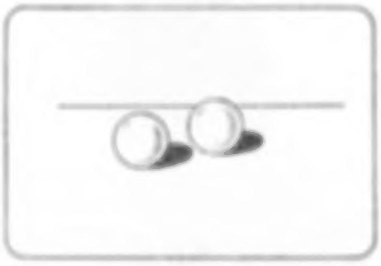
a milk man 22

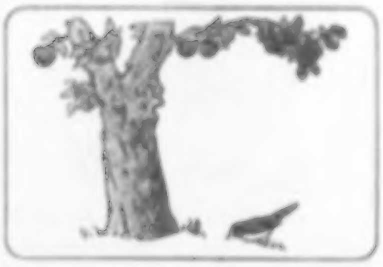




a fire man 23

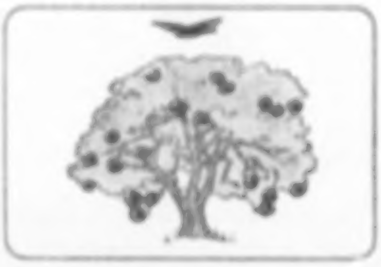
a boy making a fire 24

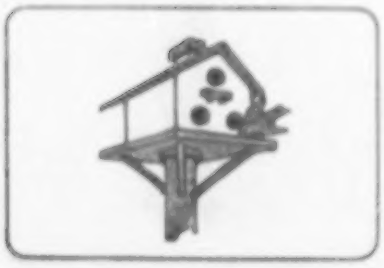




a house for a bird 25

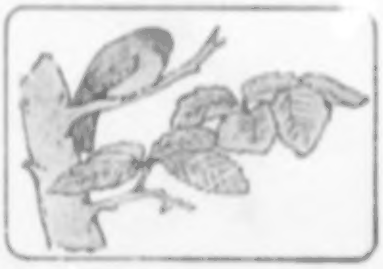
a bird sleeping in a tree 26

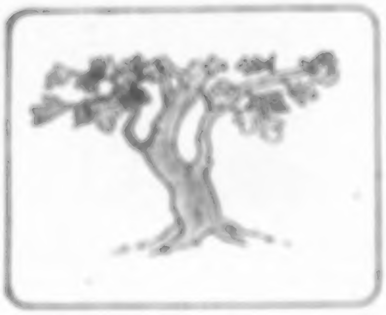




a bird flying over an apple tree 27

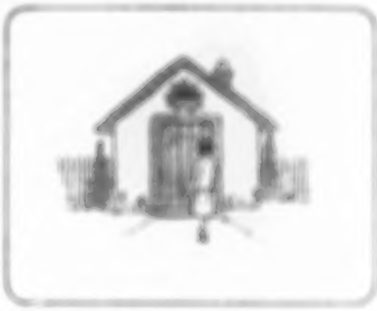
a bird under an apple tree 28

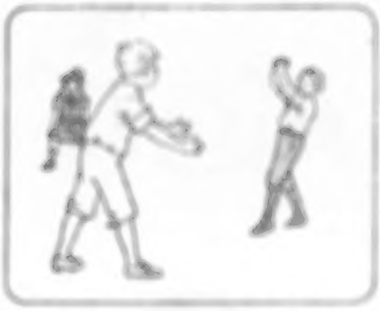




a girl going
into a house 29

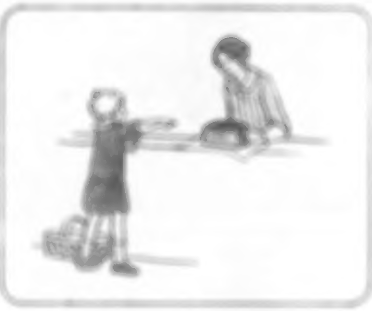
a girl buying
some bread 30

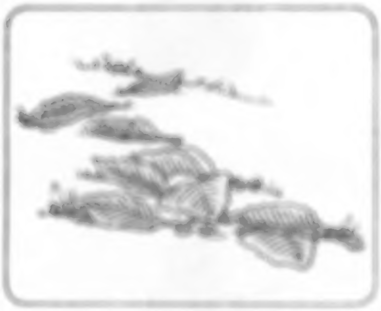




some leaves
on a tree 31

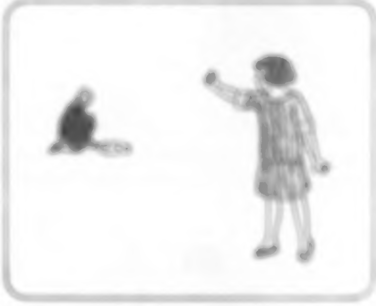
some leaves
on the ground 32

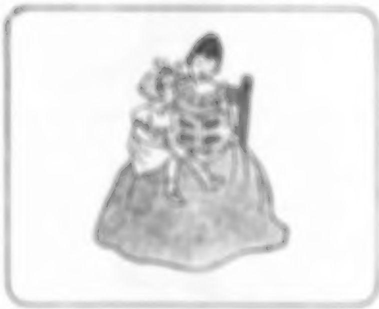




three children
playing ball 33

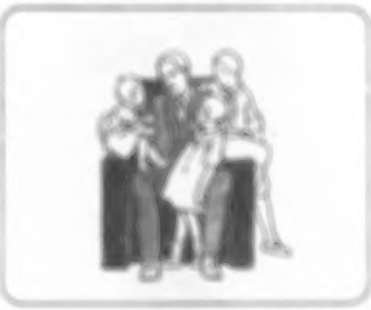
a father with his
three children 34

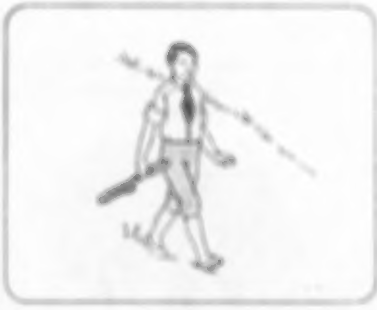




a girl telling a
boy to come 35

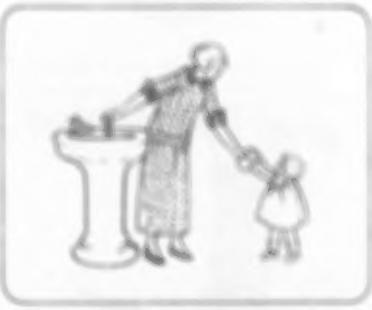
a boy walking
in the rain 36

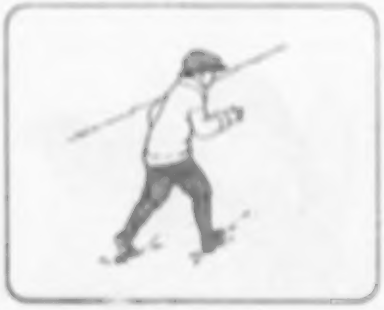




a boy walking
up a hill 37

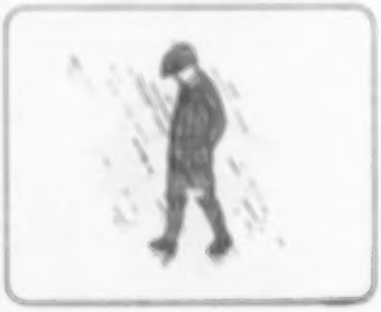
a boy walking
down a hill 38





a mother singing
to her little girl 39

a mother giving
her little girl
some water 40



FORM
A

Metropolitan Readiness Tests

by GERTRUDE H. HILDRETH, Ph.D., NELLIE L. GRIFFITHS, M.A., MARY E. McGAUVRAN, Ed.D.

NAME ____________________ BOY ___ GIRL ___ DATE OF TESTING ____________ Year Month Day

TEACHER ____________ SCHOOL ____________ DATE OF BIRTH ____________ Year Month Day

CITY __________ COUNTY __________ STATE __________ PUPIL'S AGE Yrs. ____ Mos. ____

GRADE ____________ NUMBER OF MONTHS KINDERGARTEN TRAINING ________

TEST	RAW SCORE
1. WORD MEANING	
2. LISTENING	
3. MATCHING	
4. ALPHABET	
5. NUMBERS	
6. COPYING	
Total Tests 1-6	

TOTAL READINESS

SUM OF SCORES TESTS 1-6	LETTER RATING	TOTAL READINESS STATUS	PERCENTILE RANK

HARCOURT, BRACE & WORLD, INC. NEW YORK

[illegible]

Test 1 WORD MEANING

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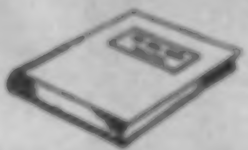
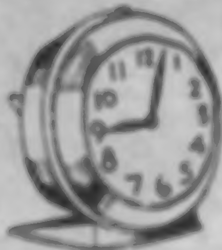
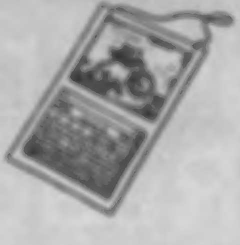

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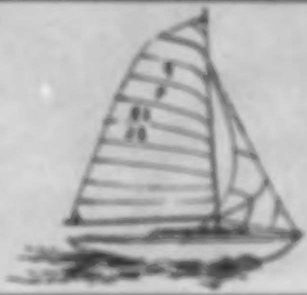
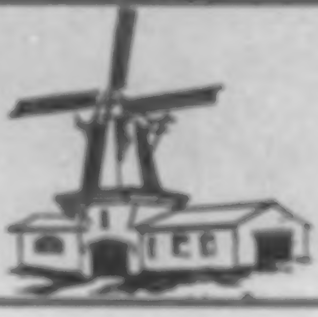
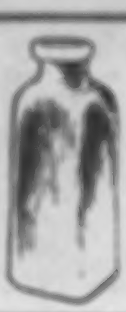

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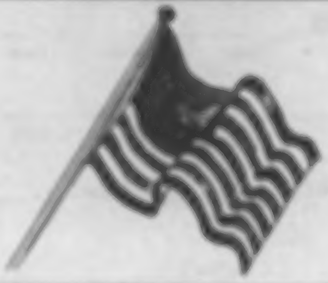
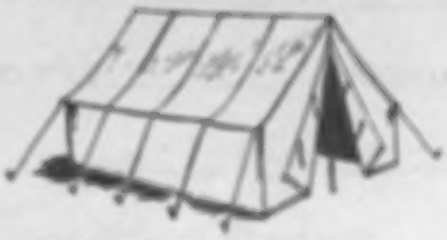
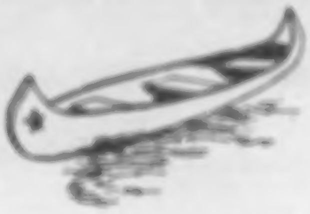

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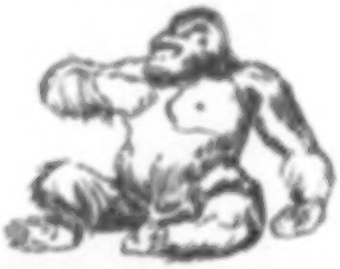
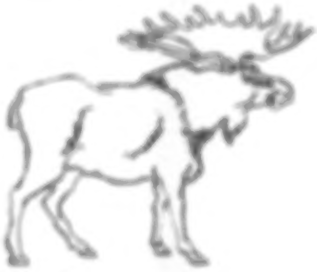
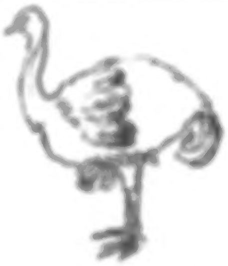

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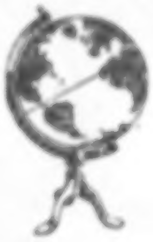
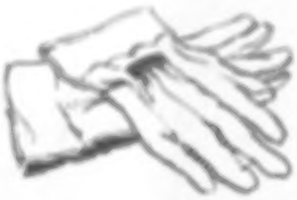
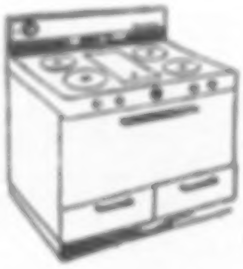

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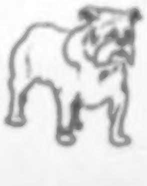
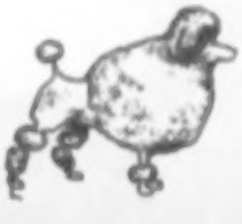
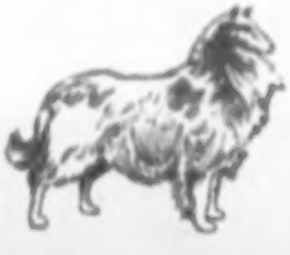

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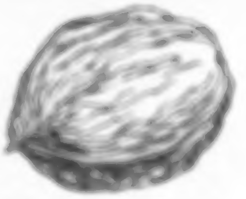
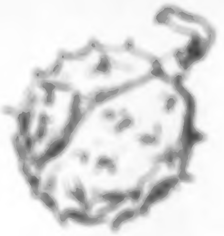
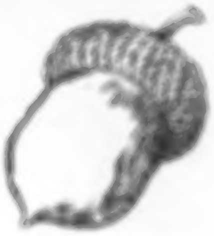

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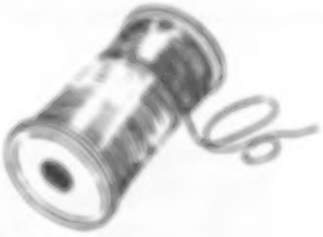
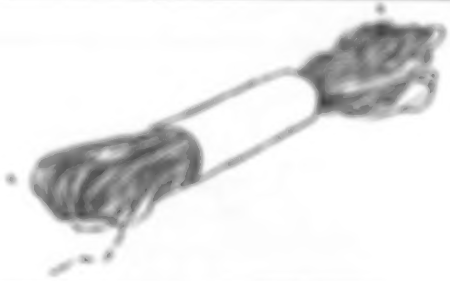
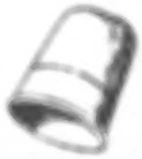

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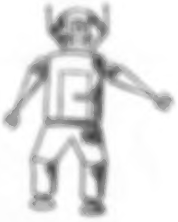
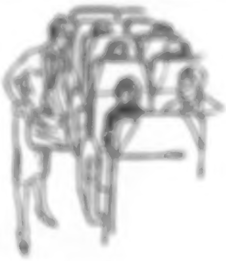
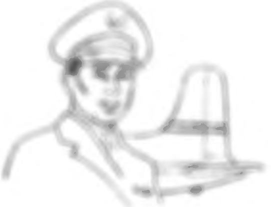

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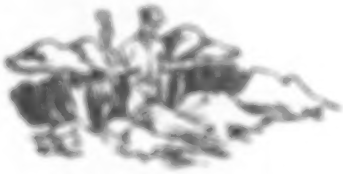
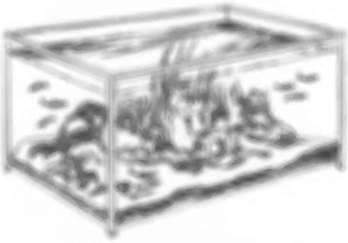
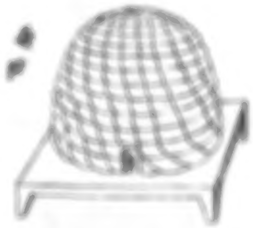

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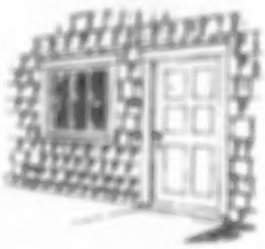
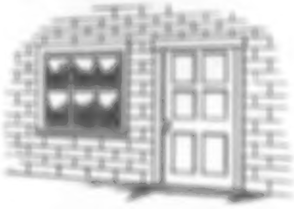
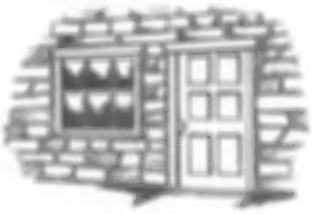

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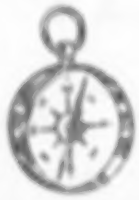
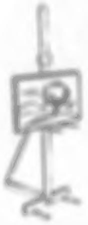
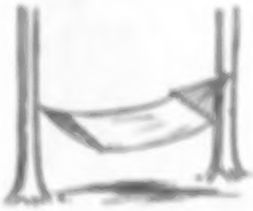

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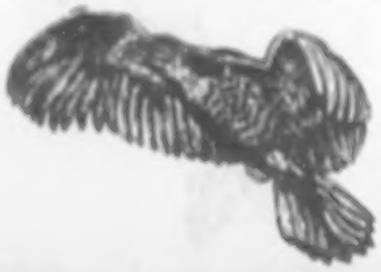
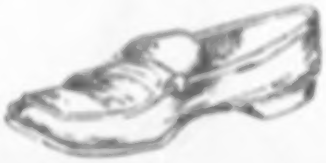
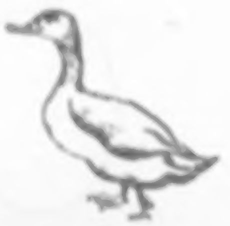

Test 1 Word Meaning CONTINUED

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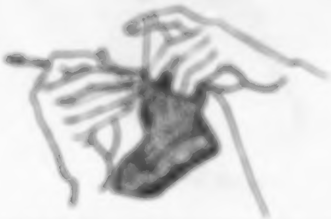
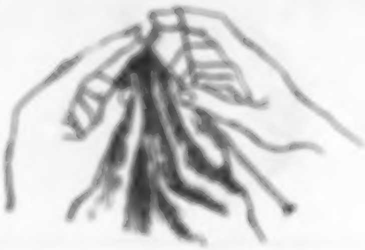
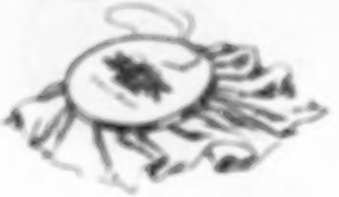

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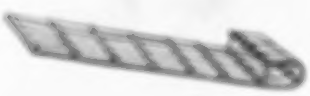
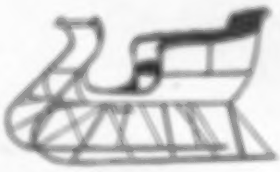
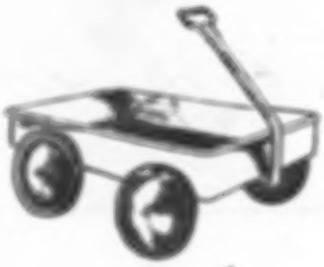

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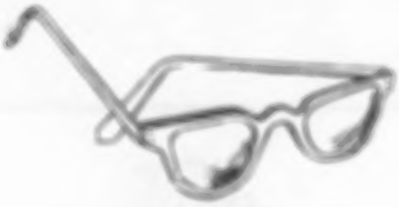
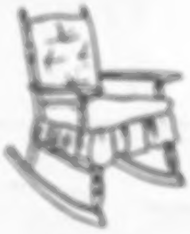
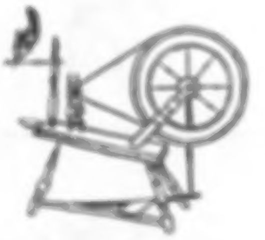

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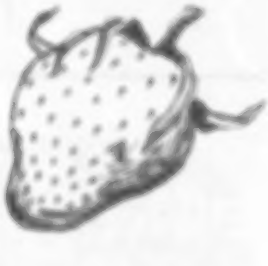
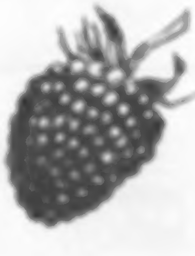
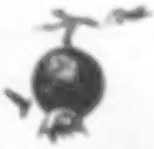

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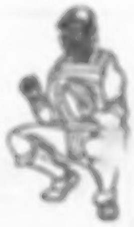
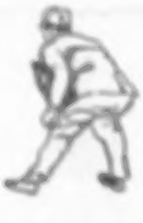
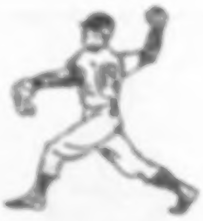

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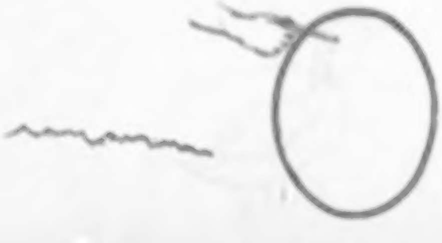
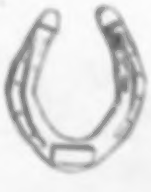
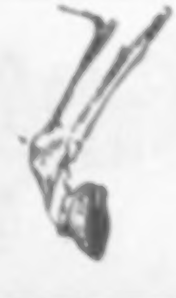

Test 2 LISTENING

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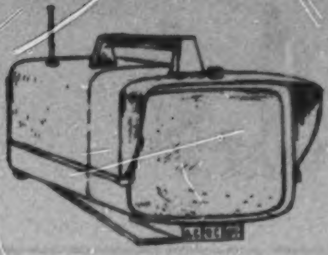
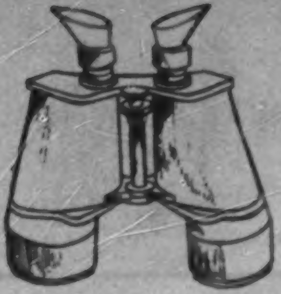
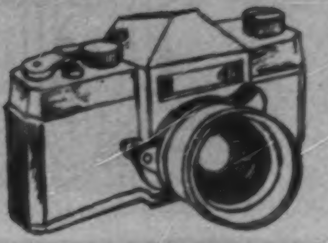

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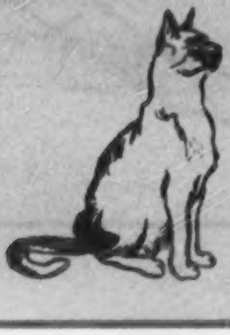
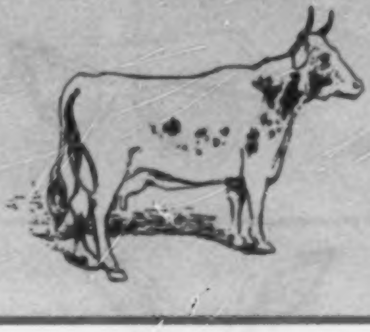
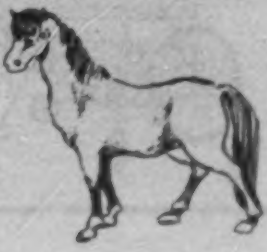

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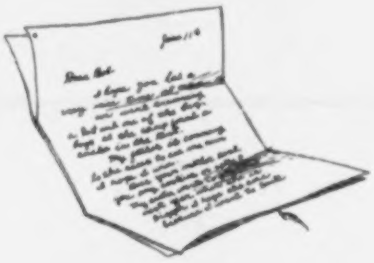
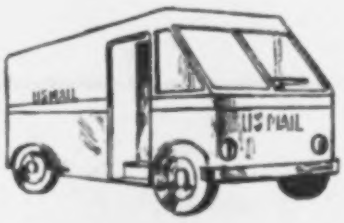
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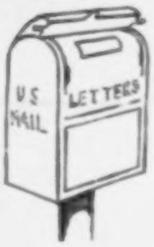
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LETTERS

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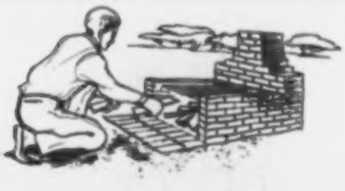
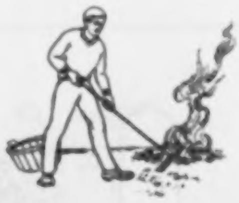
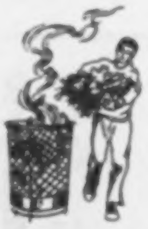

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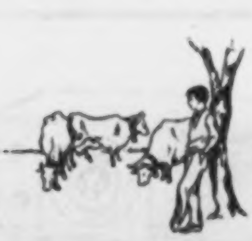
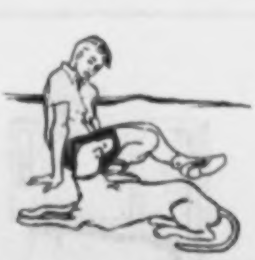
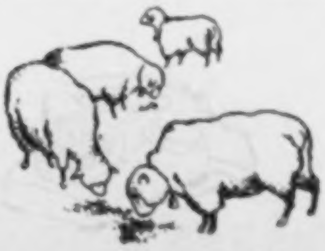

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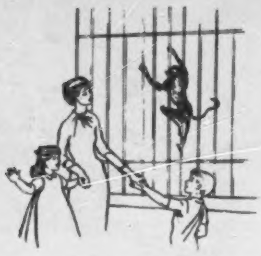

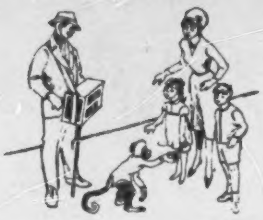

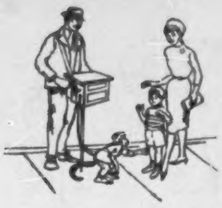

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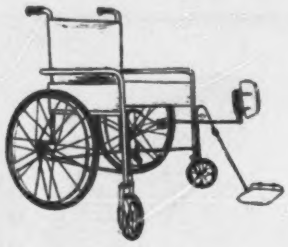

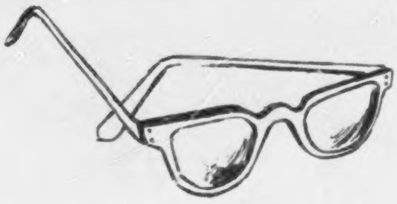

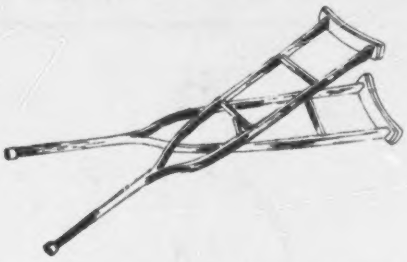

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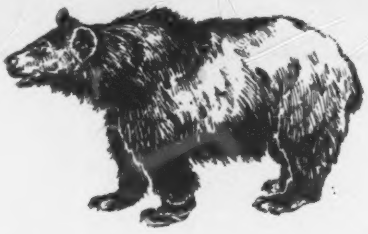

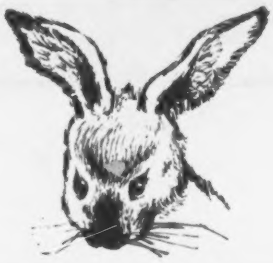

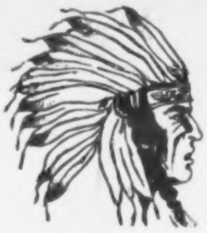

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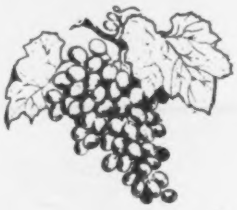

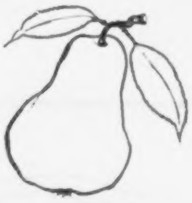

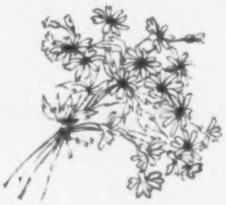

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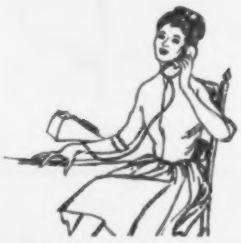

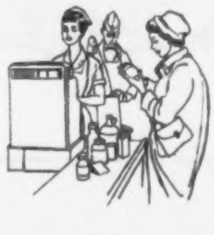

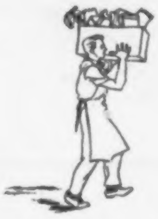

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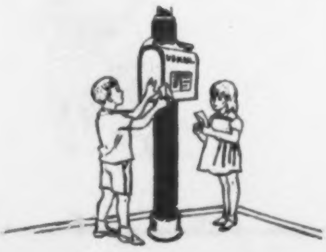

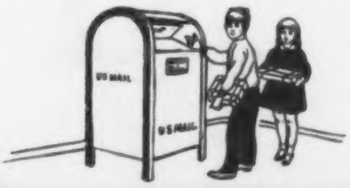

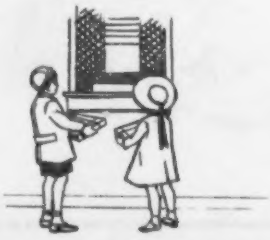

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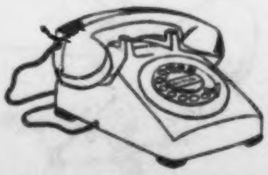

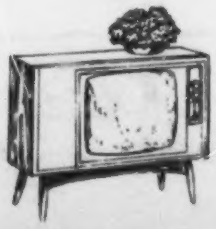

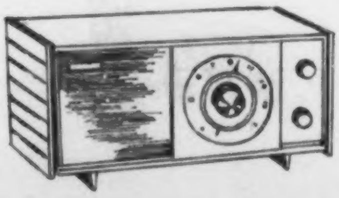

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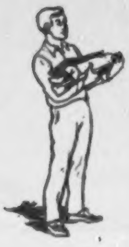

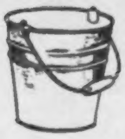

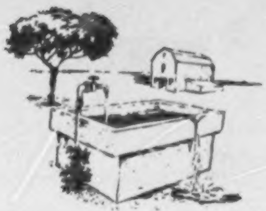

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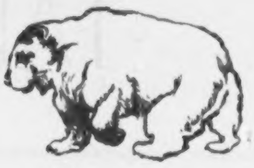

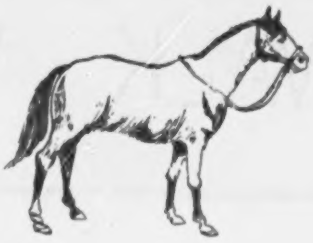

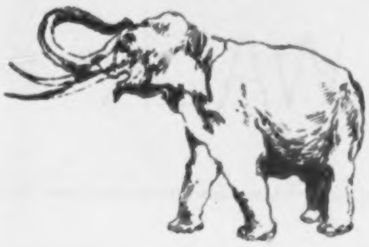

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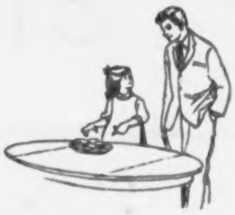

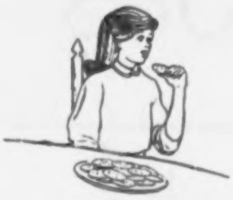

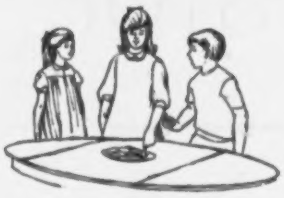

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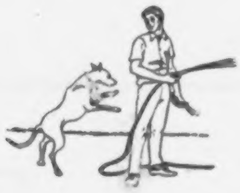

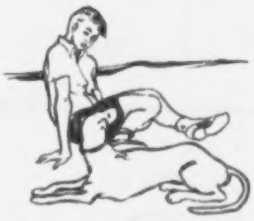

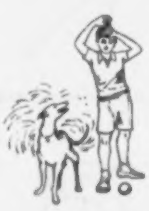

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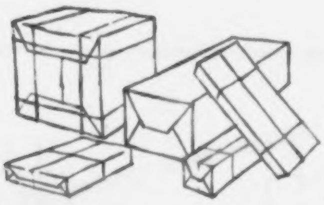

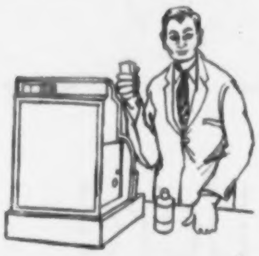

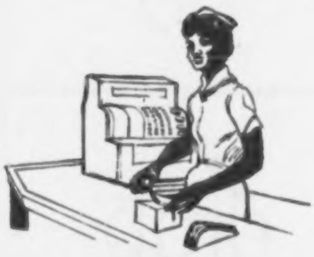

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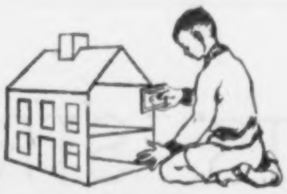
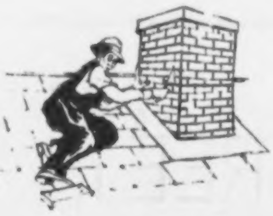
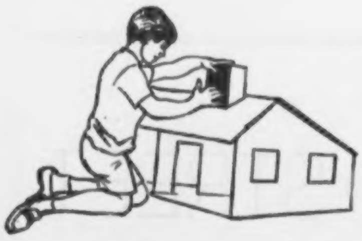
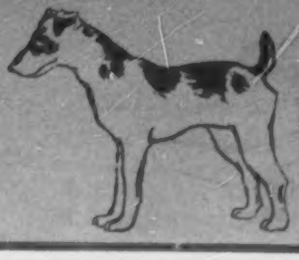
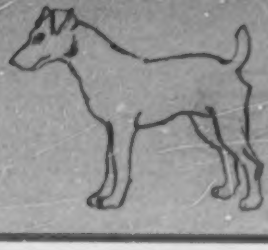
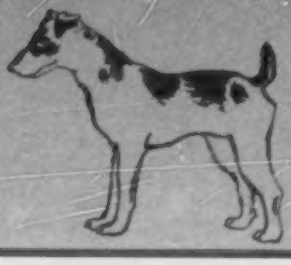
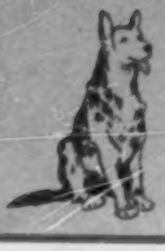






SCORE ______

Test 3 MATCHING

a				
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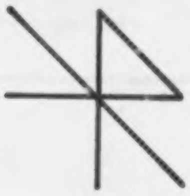
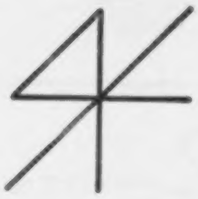
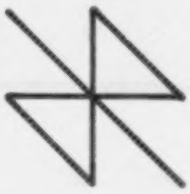
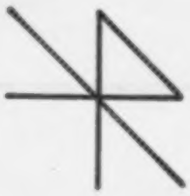
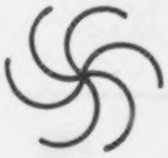
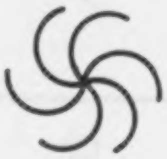
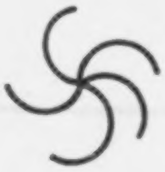
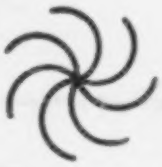
2	STOP	TOPS	STOP	ƧTOP
3				
4				
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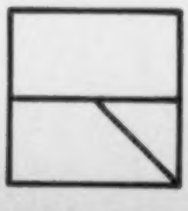
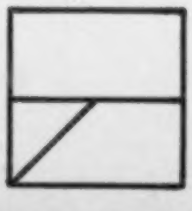
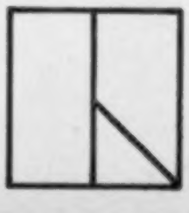
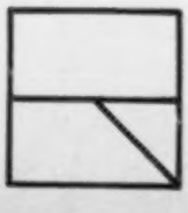
6	STREET	STREET	TREATS	STREAM
7				

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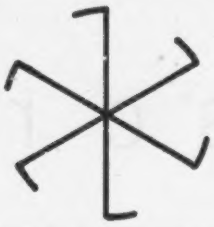
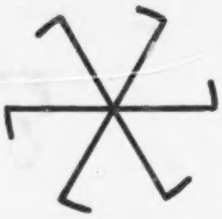
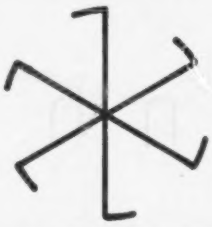
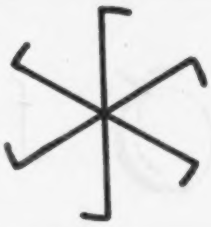
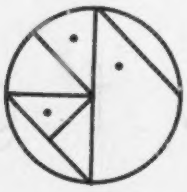
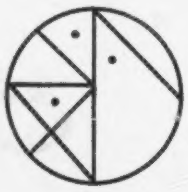
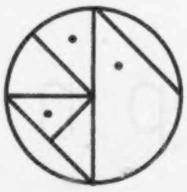
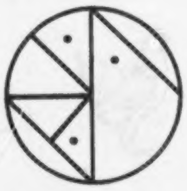
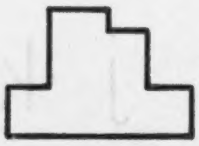
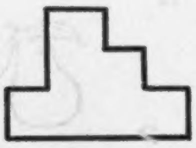
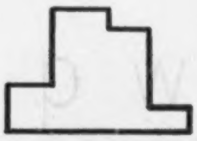
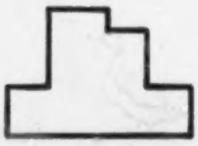
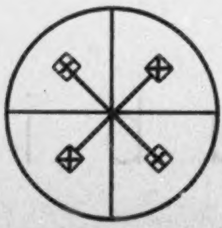
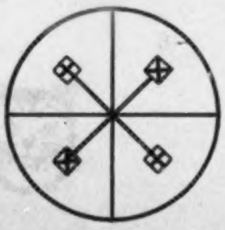
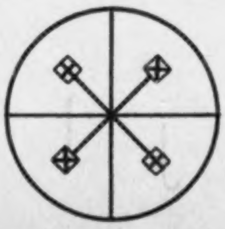
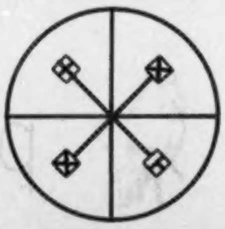
9	winter	writer	winter	winret
10	TELEPHONE	TELEPHONE	TELEGRAM	ƎLEPHANT
11	grad	grab	yard	grad
12				
13				
14				
15				

SCORE ______

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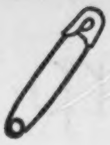
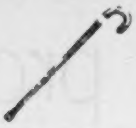
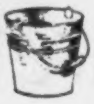
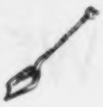
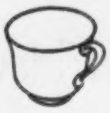
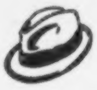
1  y s n i

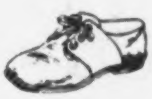
2  o e y g

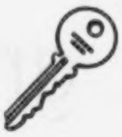
3  i m s c

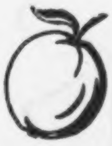
4  q a z k

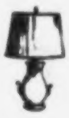
5  u m e c

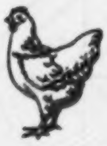
6  q b e z

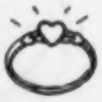
7  v p h x

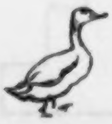
8  j t g c

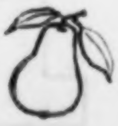
9  f a n h

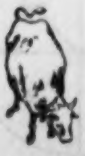
10  f s a r

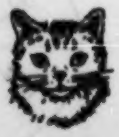
11  u y p n

12  d w f g

13  j f w q

14  d t j k

15  p k j l

16  q u b i

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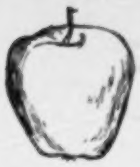

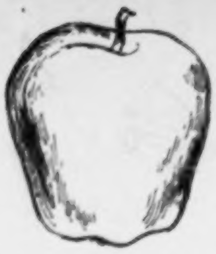

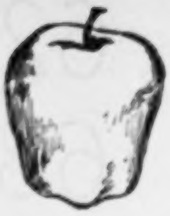

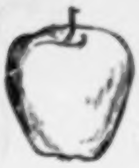

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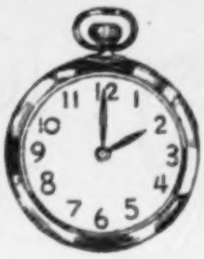

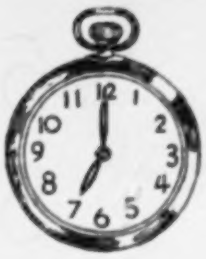

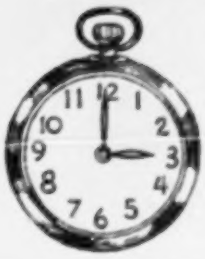

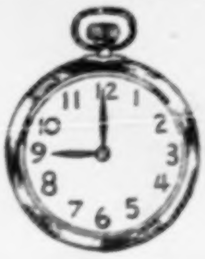

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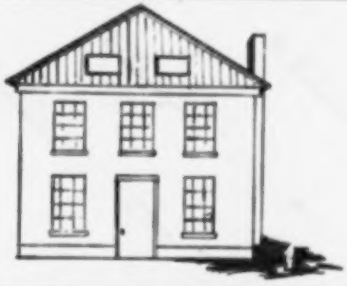

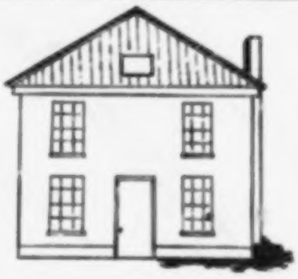

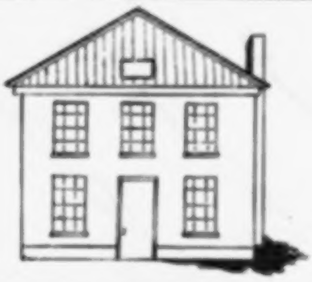

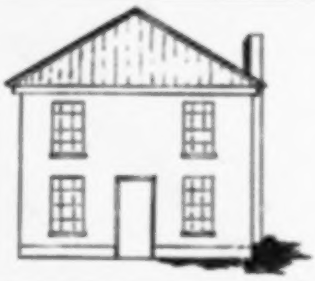

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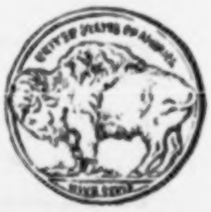
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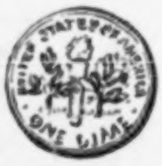
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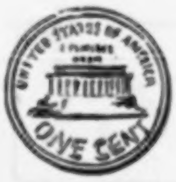
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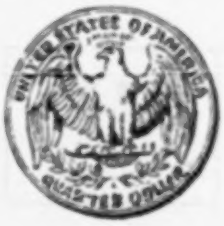
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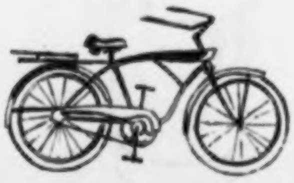

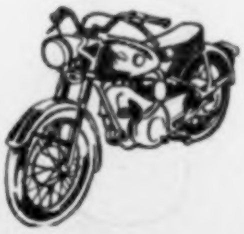

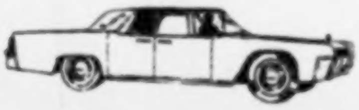

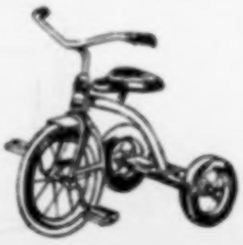

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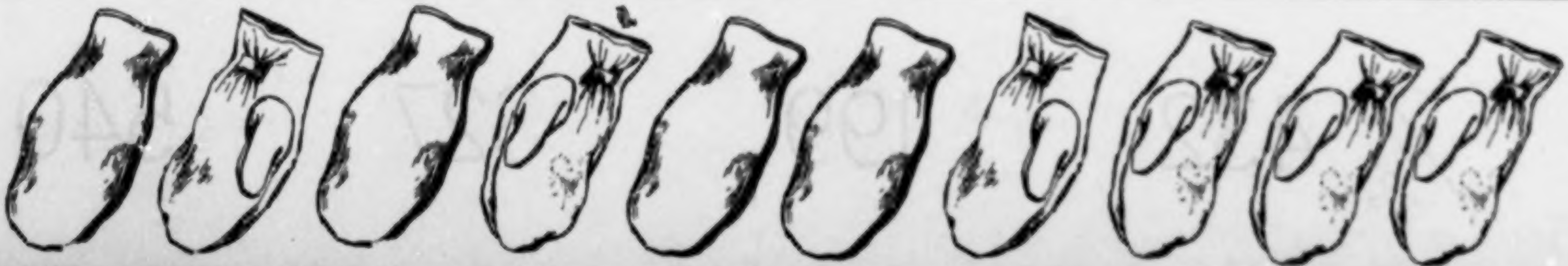

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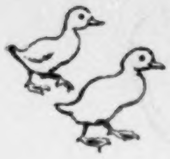

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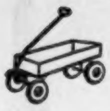

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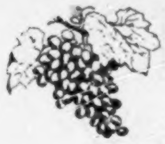

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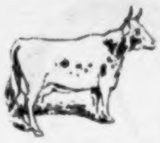

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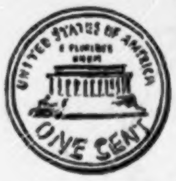
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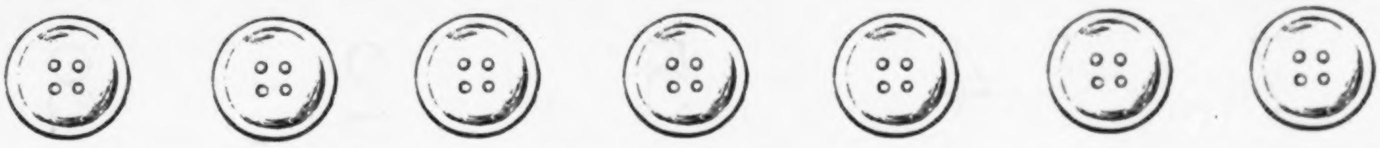

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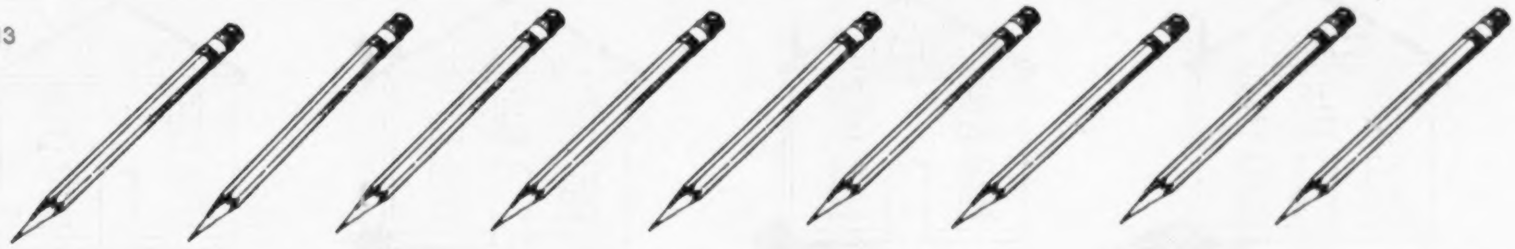

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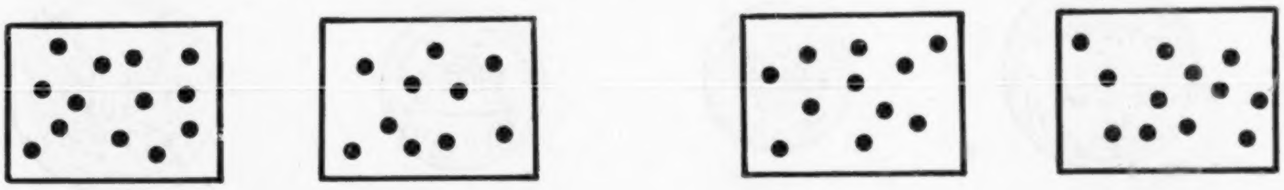

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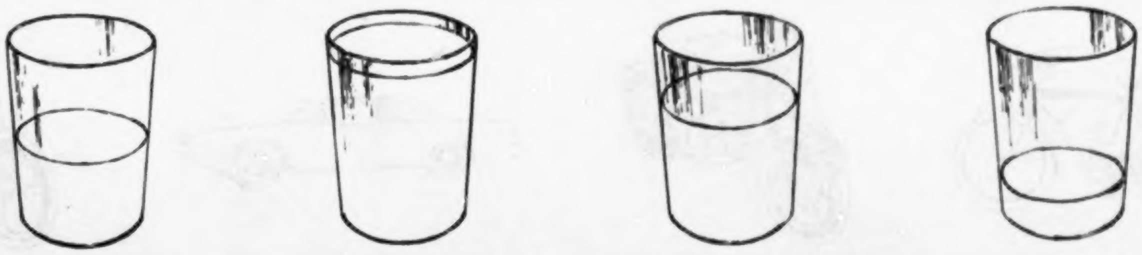

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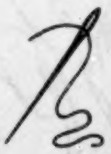

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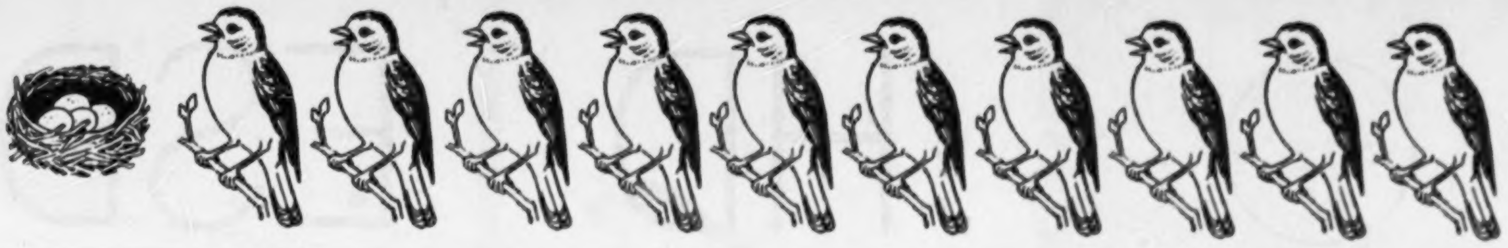

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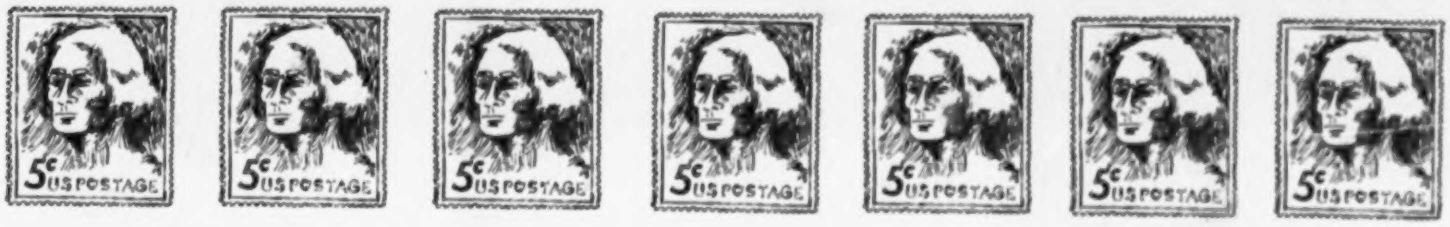
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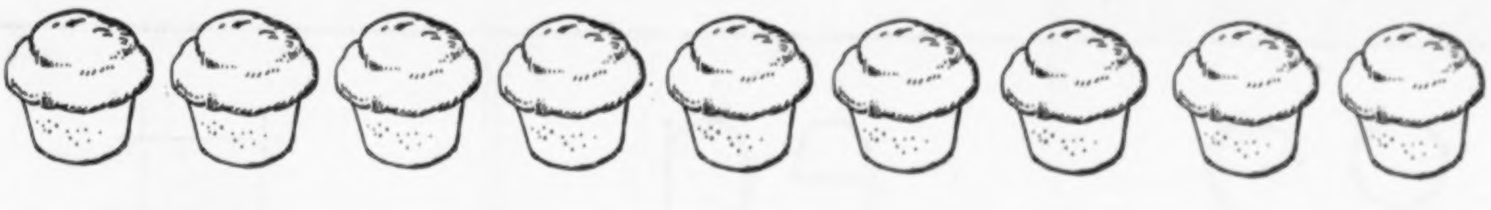

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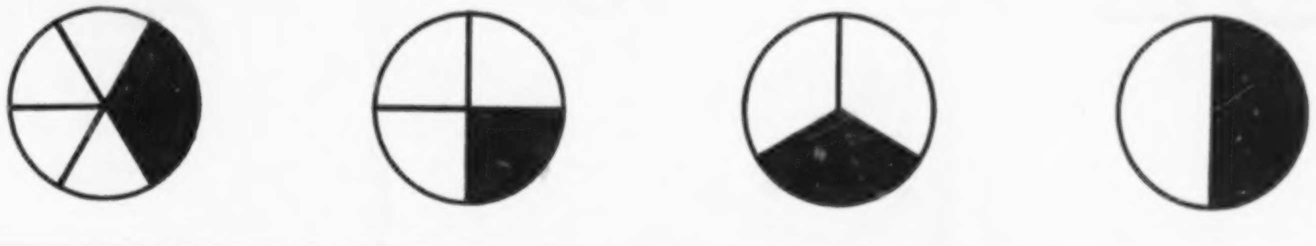

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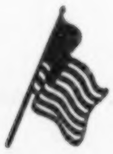

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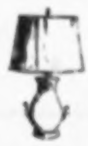

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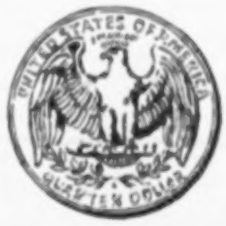
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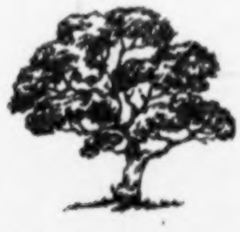

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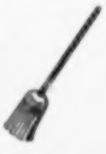

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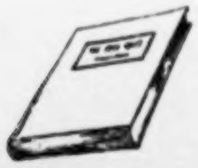

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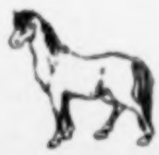

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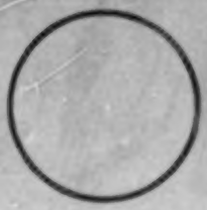

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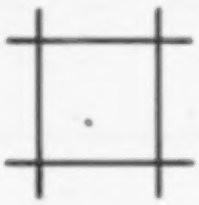

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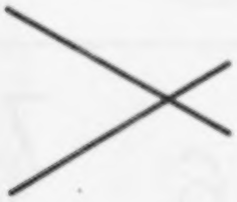

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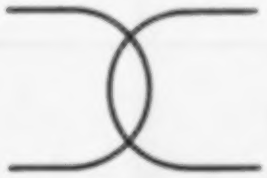

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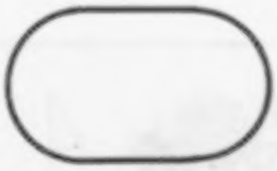

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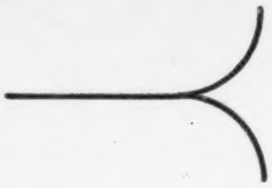

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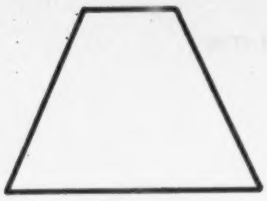

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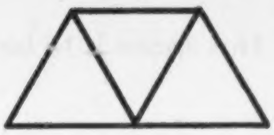

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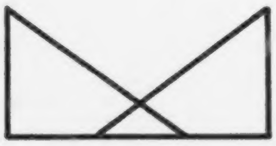

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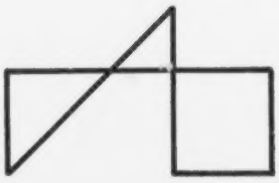

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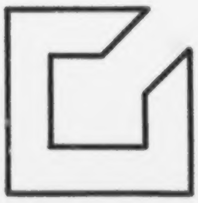


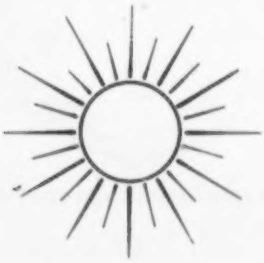
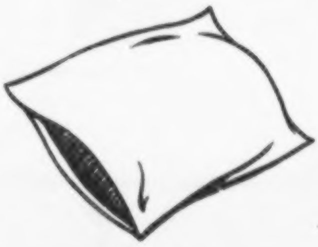
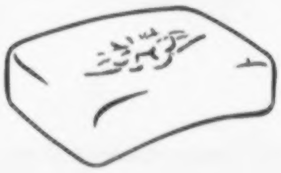
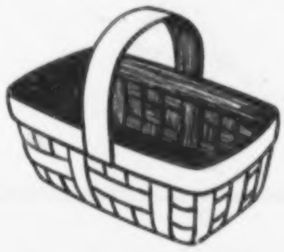
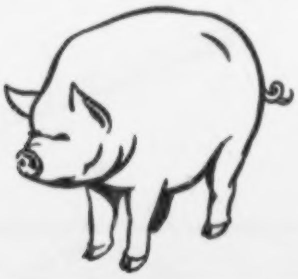
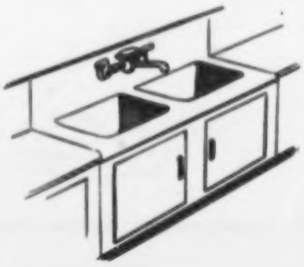
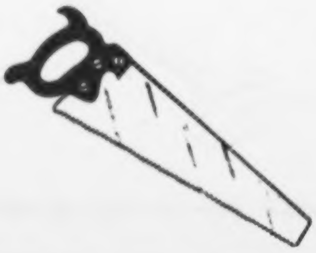
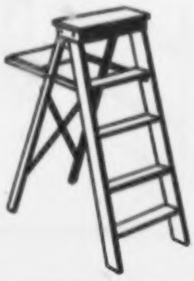
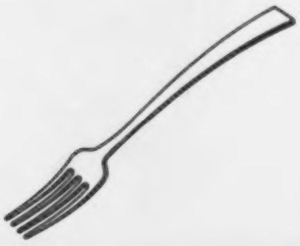
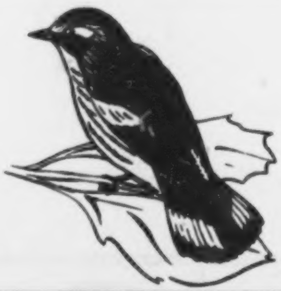
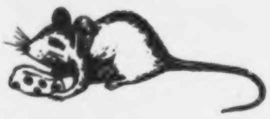
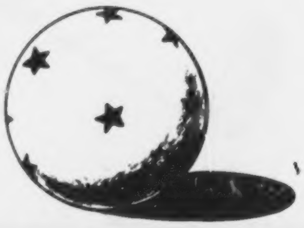
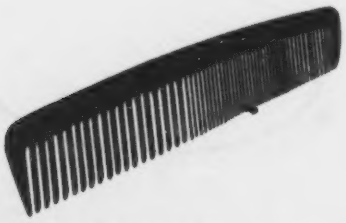
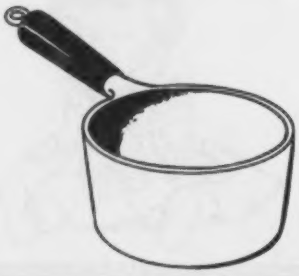
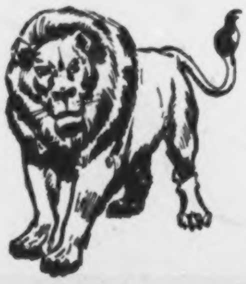
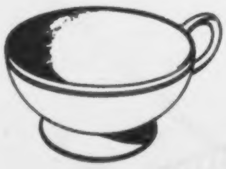
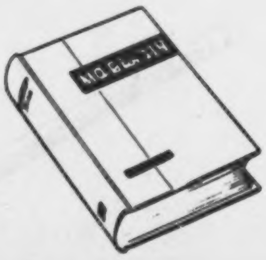
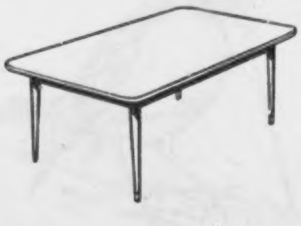
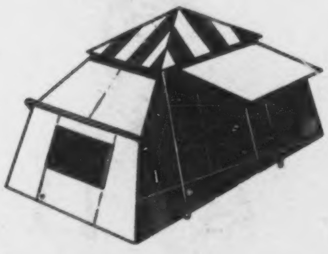
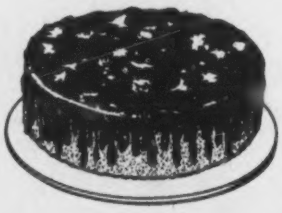
MURPHY-DURRELL
Diagnostic Reading Readiness Test REVISED EDITION

by Helen A. Murphy and Donald D. Durrell
School of Education, Boston University

Name____________________ Teacher____________________

Town____________________ School________________ Date__________

PHONEMES TEST PART I

1 			
2 			
3 			
4 			
5 			

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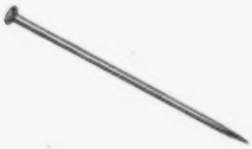
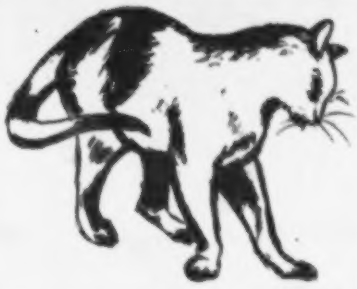
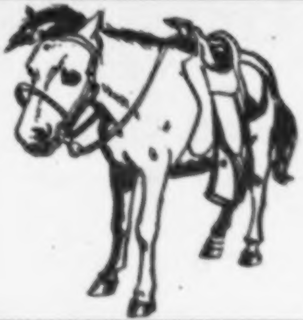
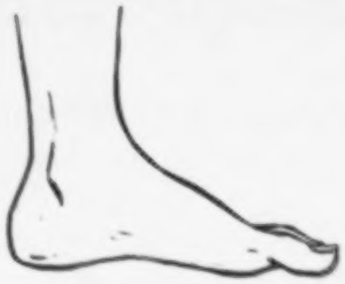
PHONEMES TEST **PART I** continued

6

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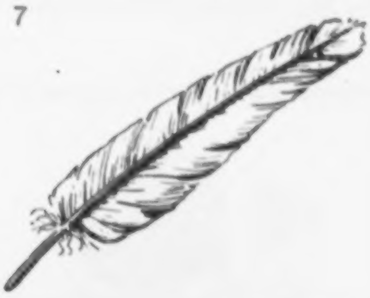
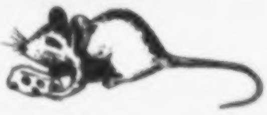
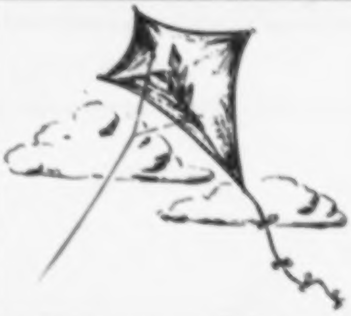
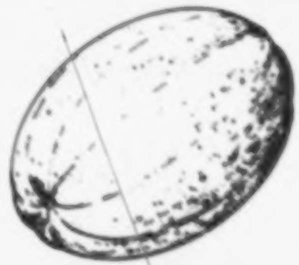

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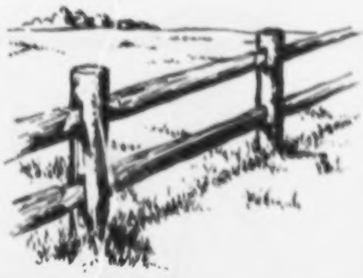
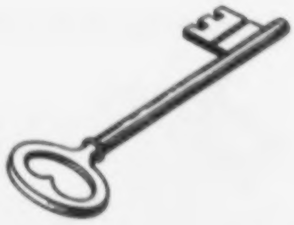
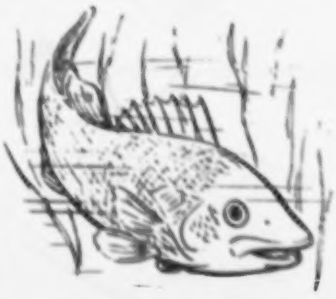
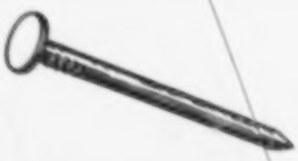

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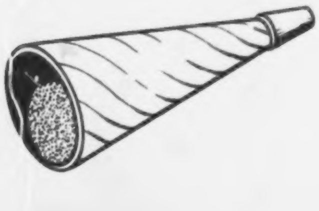
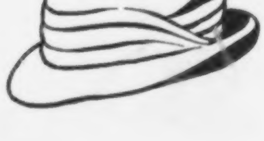
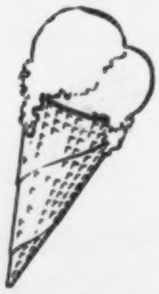
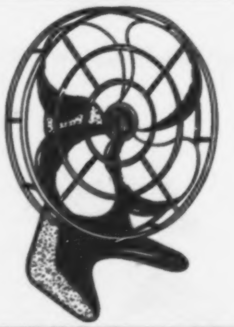

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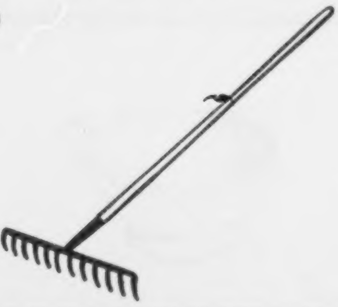
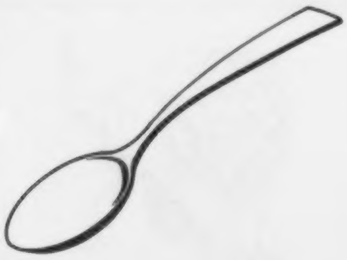
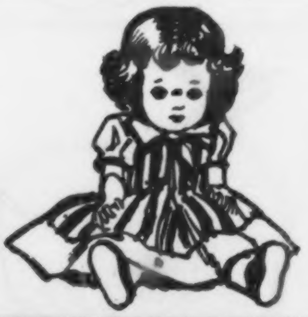
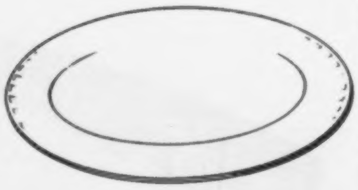

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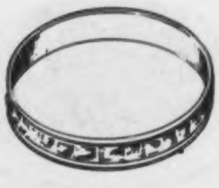
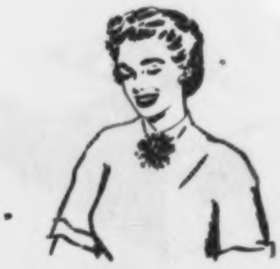
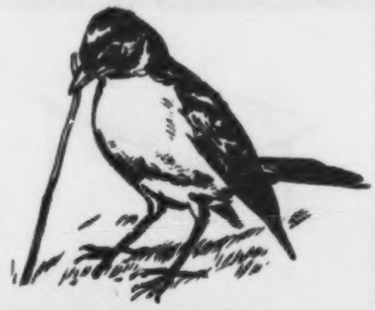
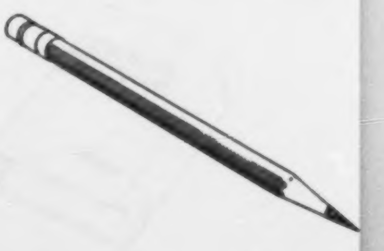

LETTER NAMES TEST

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	H	C	D	O	T	15		O	D	C	Y	G
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	I	H	E	L	F	17		N	O	M	K	E
	B	E	R	F	A	18		U	P	J	X	L
	N	I	Z	B	L	19		A	Y	C	T	V
	U	B	O	F	P	20		L	W	F	N	M
	E	N	S	O	C	21		M	T	W	E	F
	F	I	J	Y	L	22		B	L	V	T	K
	B	R	X	E	P	23		Z	G	N	K	F
	U	S	O	Z	C	24		Y	K	T	L	V
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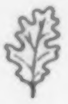
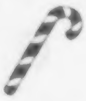
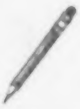
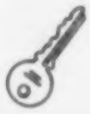
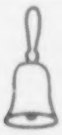
LETTER NAMES TEST continued

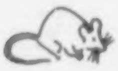
27  o s y b m

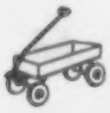
28  r a f m e

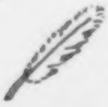
29  s m o x z

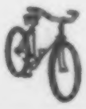
30  g p q h y

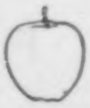
31  k t f l h

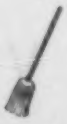
32  k l h f t

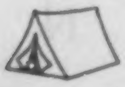
33  m f s z e

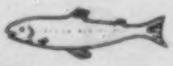
34  l t k b h

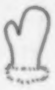
35  o a e c g

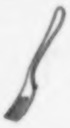
36  d r e o c

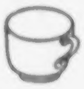
37  n u w r m

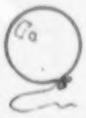
38  k i g t y

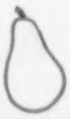
39  m v u c h

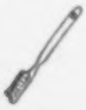
40  d b g p q

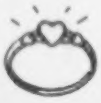
41  g b d q p

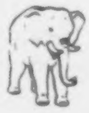
42  b d p q g

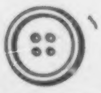
43  q p d g b

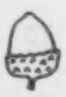
44  r m n u o

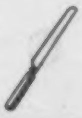
45  o a e g c

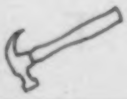
46  h f l t k

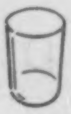
47  t e j l i

48  g p y j i

49  m n u d b

50  u n v w m

51  c d a e o

52  w y v n u

PHONEMES TEST **PART II**

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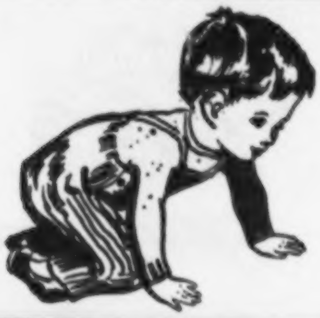

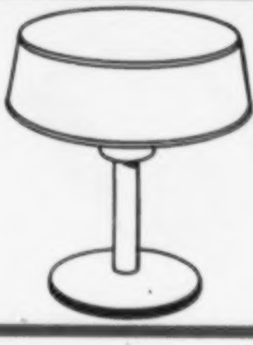

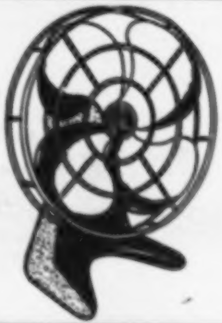

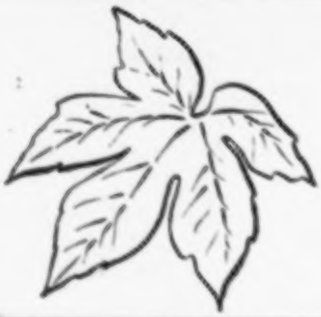

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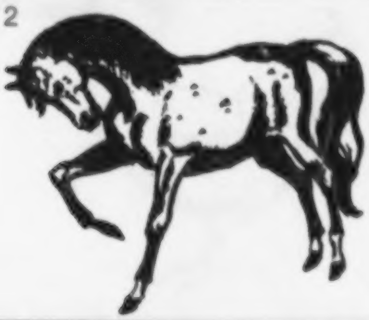

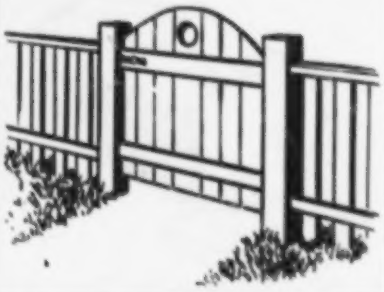

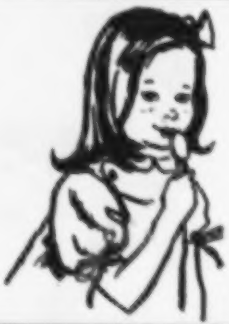

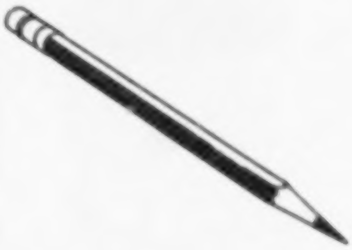

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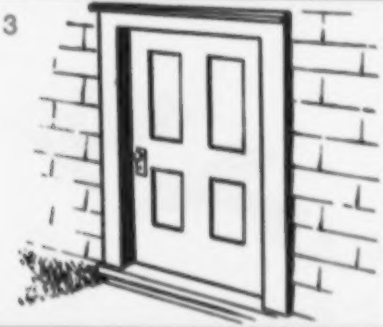

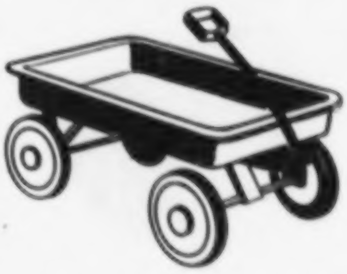

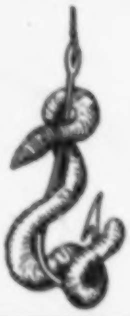

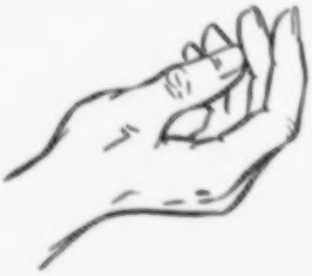

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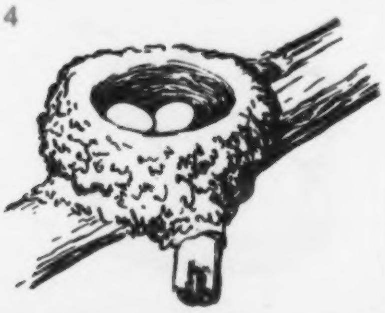

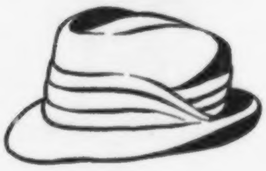

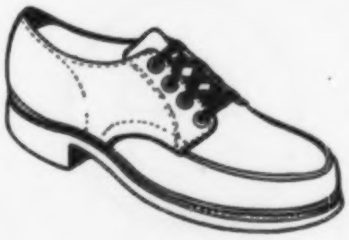

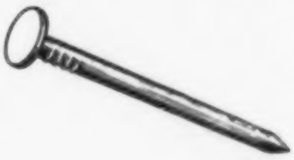

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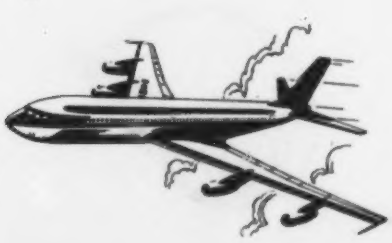

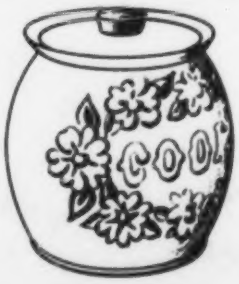

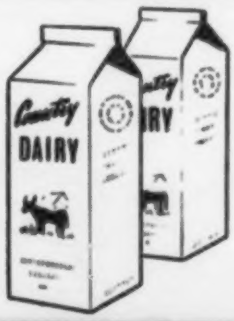
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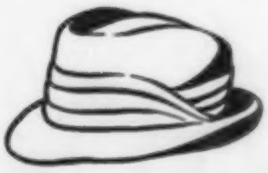

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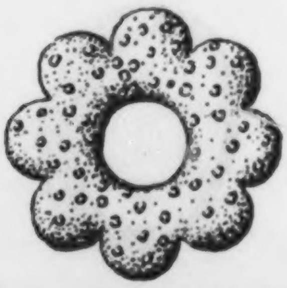

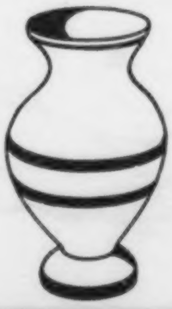

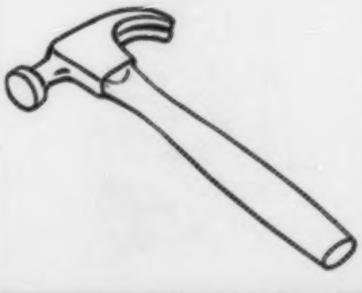

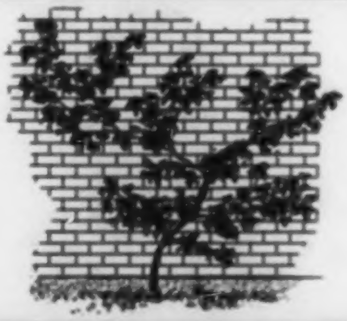

PHONEMES TEST **PART II** continued

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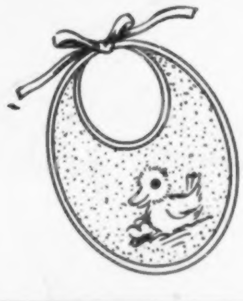

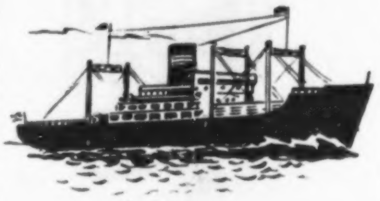

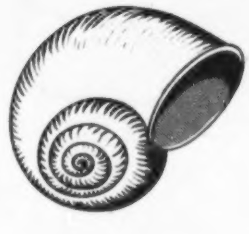

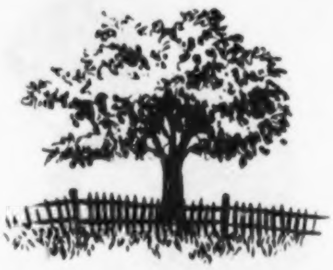

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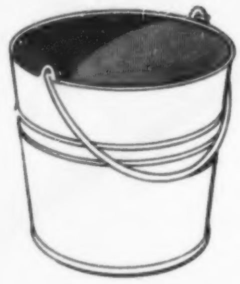

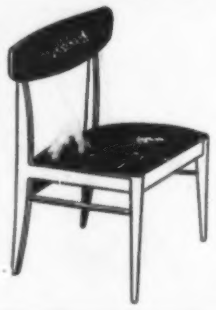

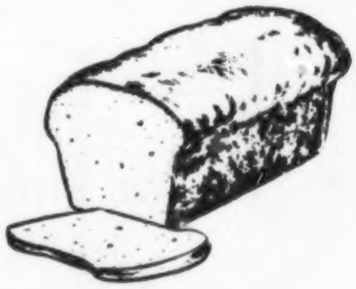

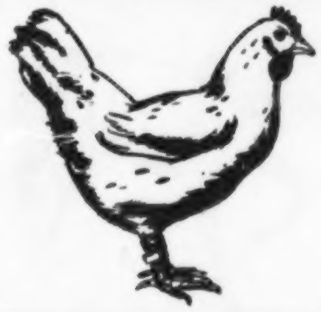

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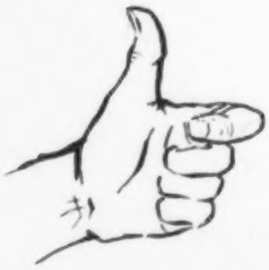

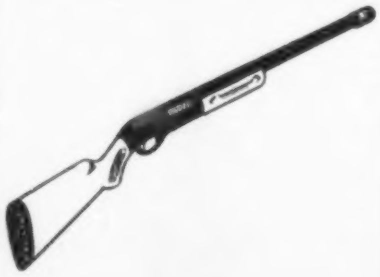

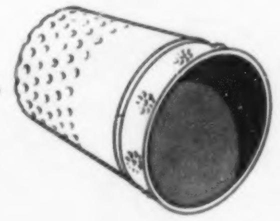

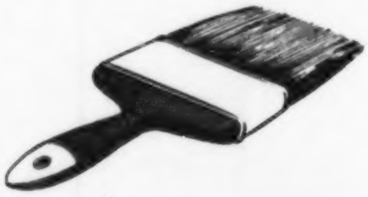

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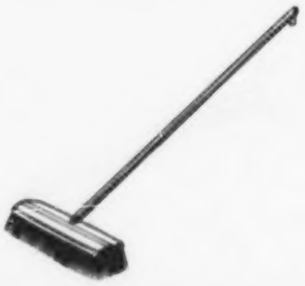

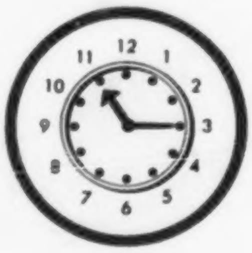

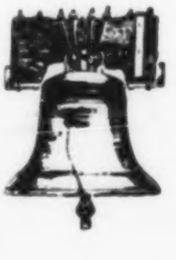

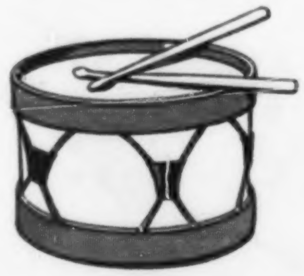

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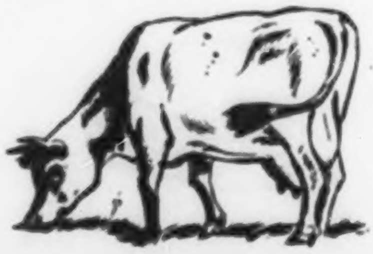

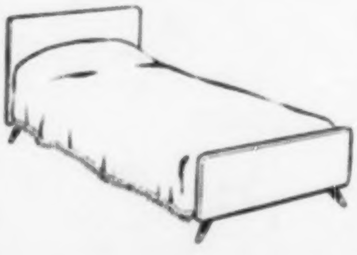

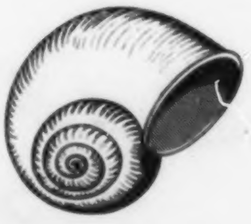

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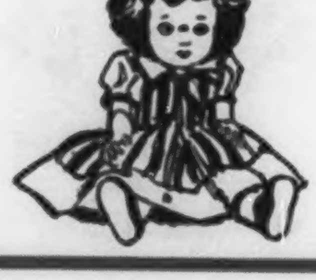
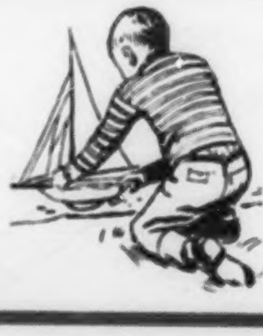
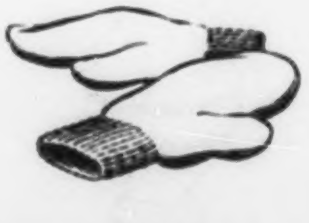
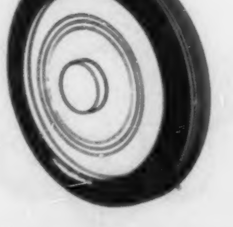
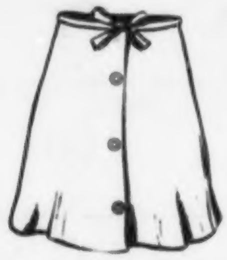
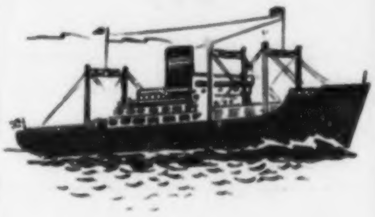
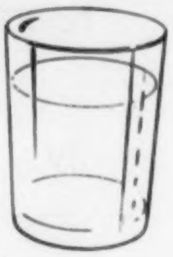
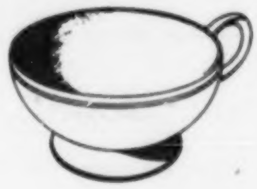
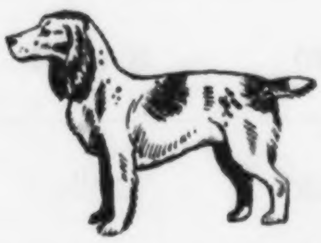
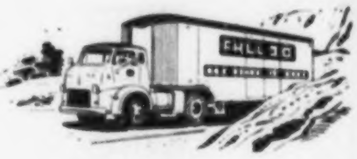
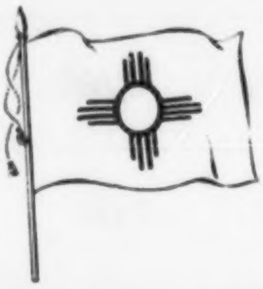
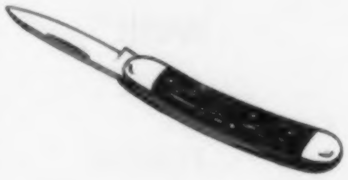








PHONEMES TEST **PART II** continued

13 			
14 			

LEARNING RATE TEST

1	eyes	cold	hand
2	away	warm	tongue
3	sell	hair	went
4	train	swim	build
5	walk	boy	fire
6	help	most	fly
7	step	thank	round
8	sit	clean	water
9	heavy	dress	fold

LEARNING RATE TEST continued

10	tongue	walk	round	19	buy	farm	fly
11	clean	eyes	fly	20	hard	hair	pair
12	hair	swim	clean	21	table	hang	tongue
13	walk	heavy	eyes	22	swim	him	sweet
14	round	fly	hair	23	wore	talk	walk
15	tongue	heavy	swim	24	eyes	every	you
16	fly	round	walk	25	found	reach	round
17	clean	tongue	hair	26	try	heavy	heard
18	swim	heavy	eye	27	close	barn	clean

TEST	SCORE	PERCENTILE
Phonemes Part I		▨
Phonemes Part II		▨
Total		
Letter Names		
Learning Rate		
Total		

Name ____________________

Date of Testing ______ Year ______ Month ______ Day

Date of Birth ______ Year ______ Month ______ Day

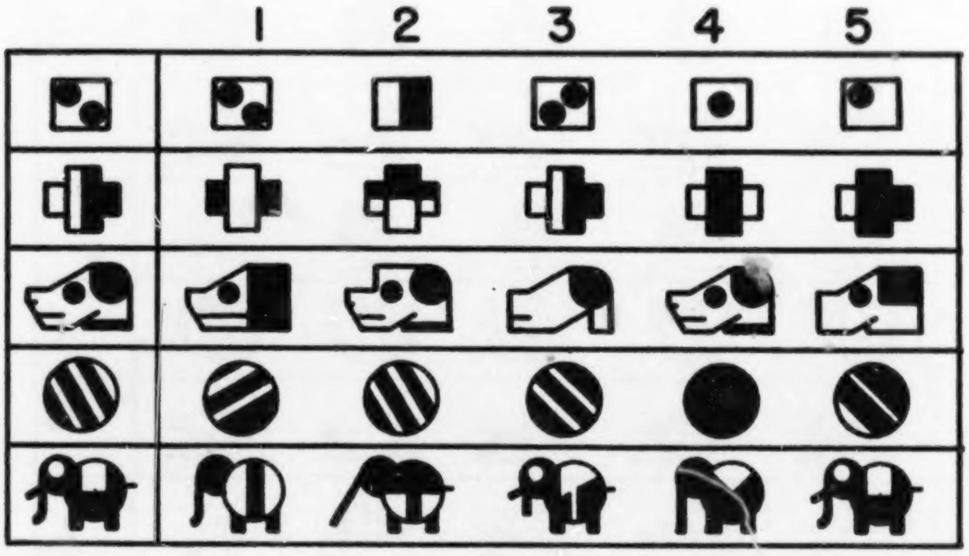
Pupil's Age ______ Years ______ Months

IDENTICAL FORMS

A Test of Perceptual Speed

Prepared by
L. L. THURSTONE AND T. E. JEFFREY
THE PSYCHOMETRIC LABORATORY
THE UNIVERSITY OF NORTH CAROLINA

NAME .... GRADE ....



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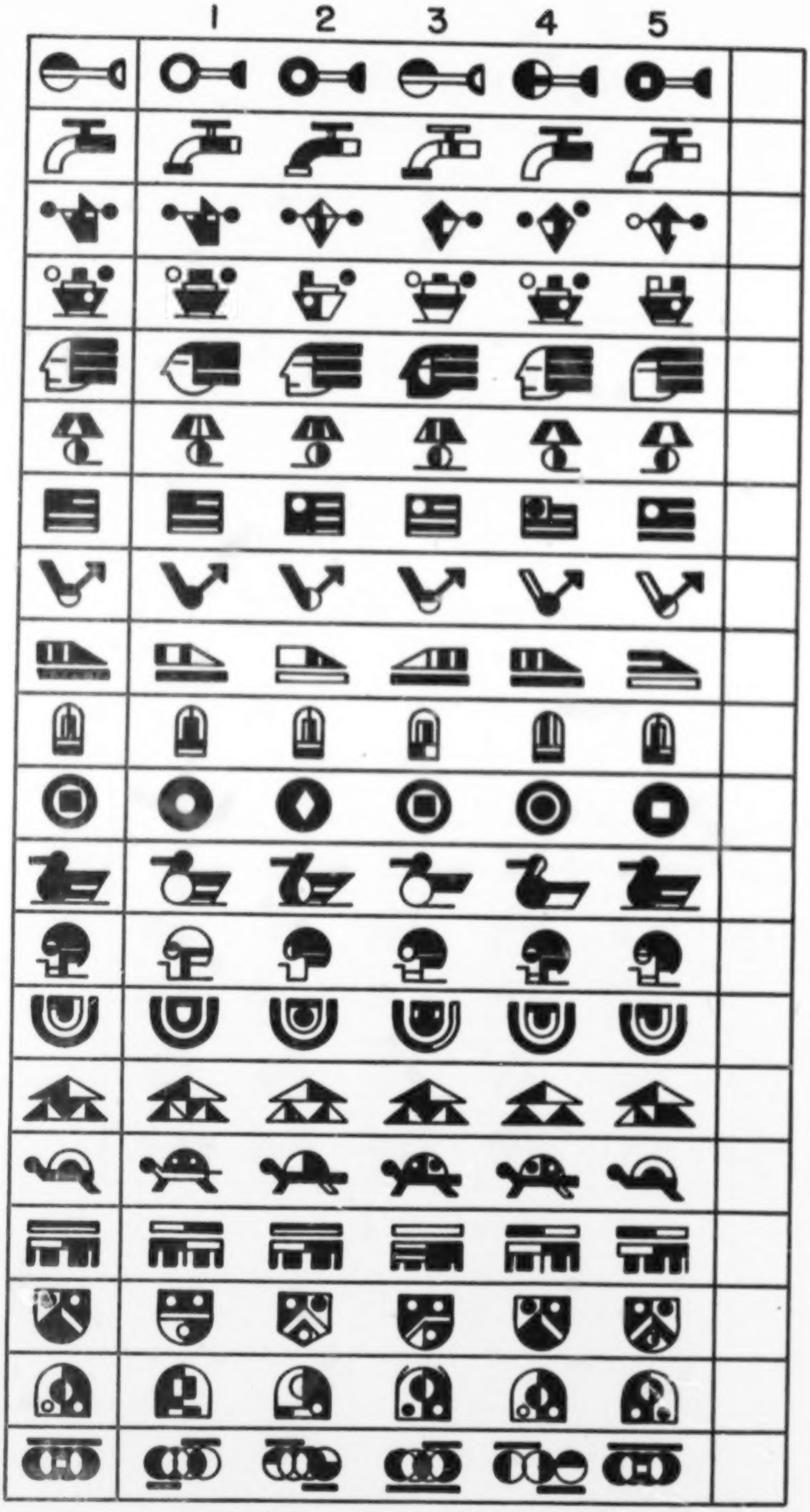

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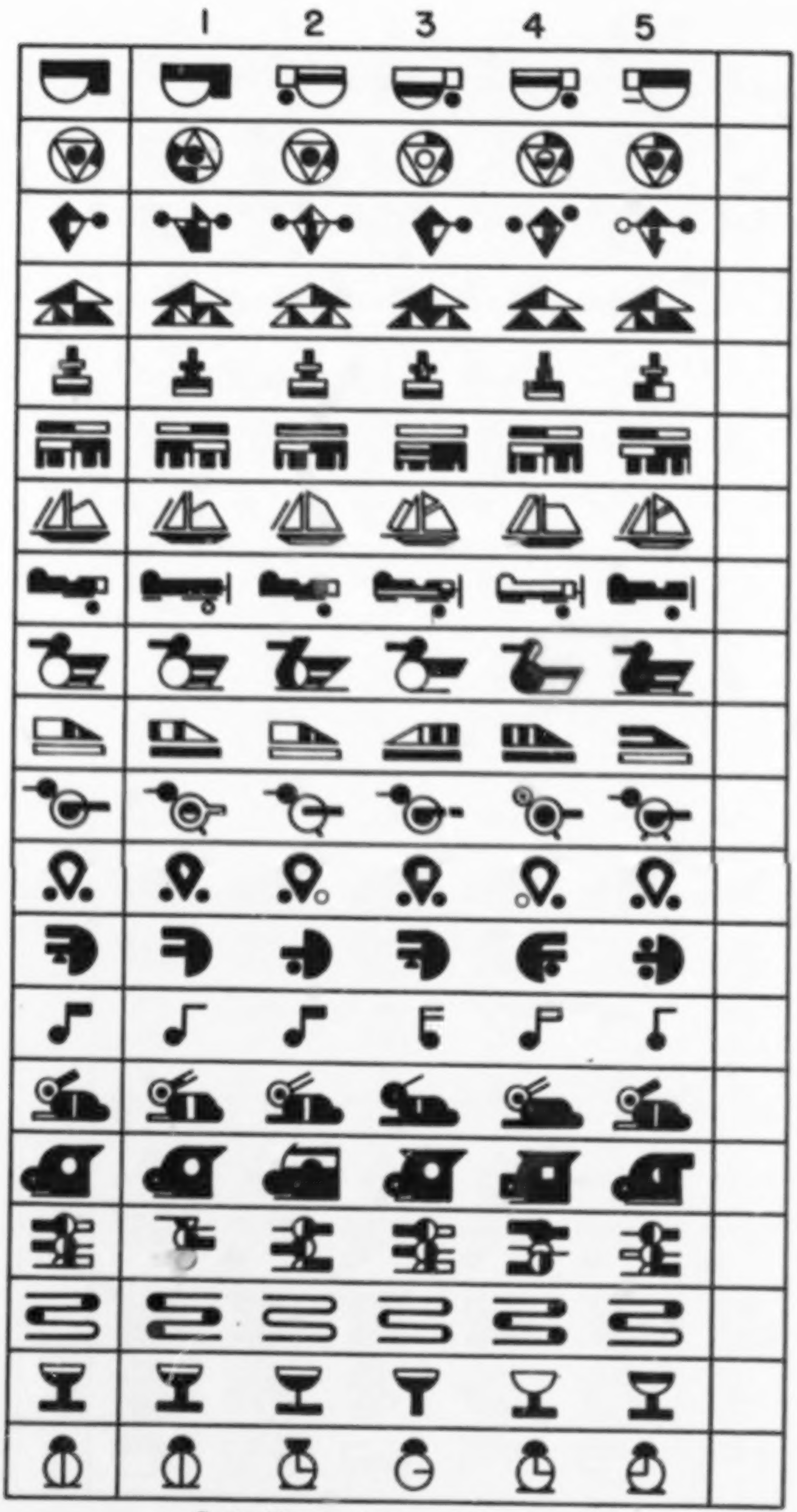

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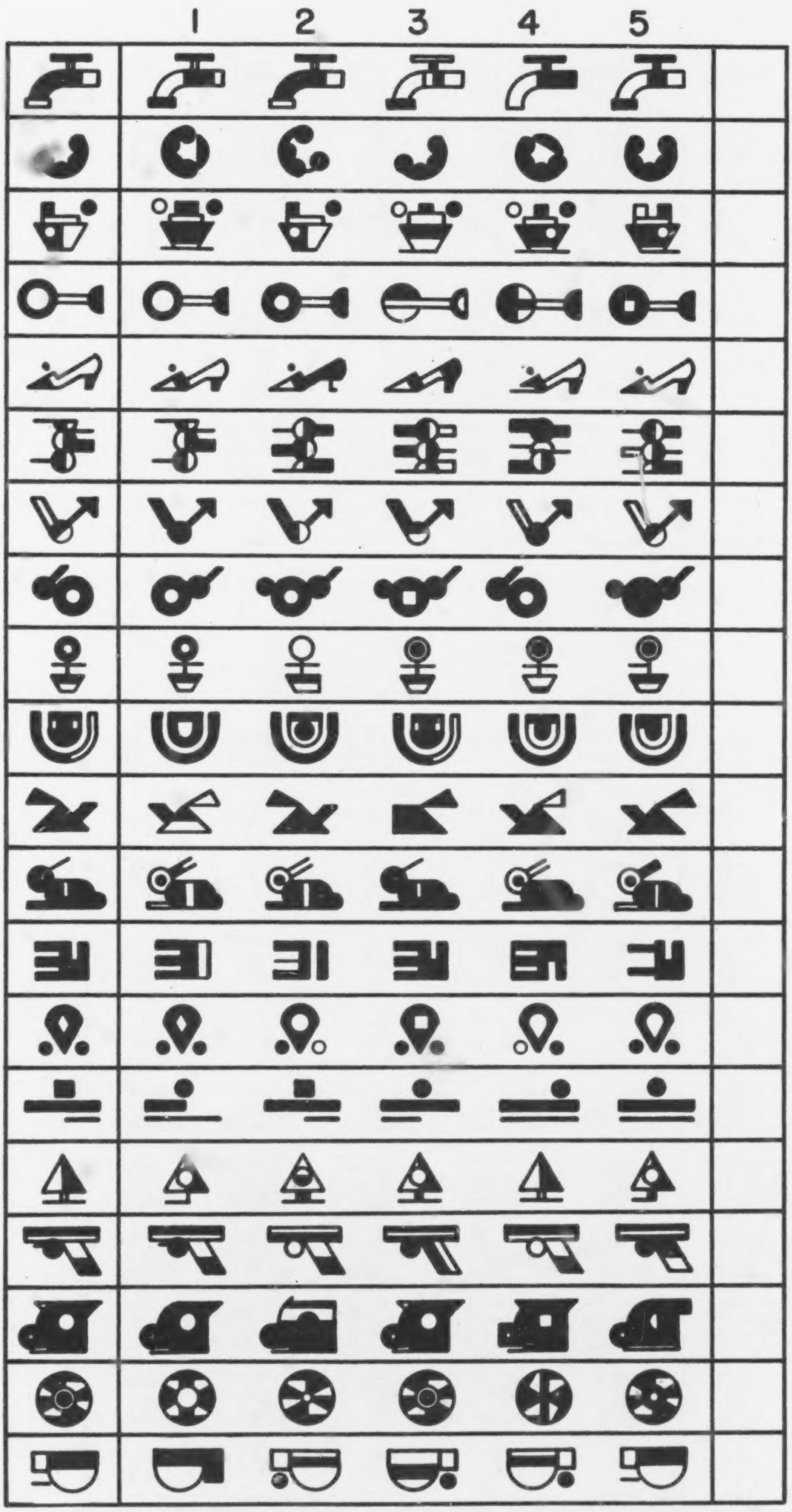

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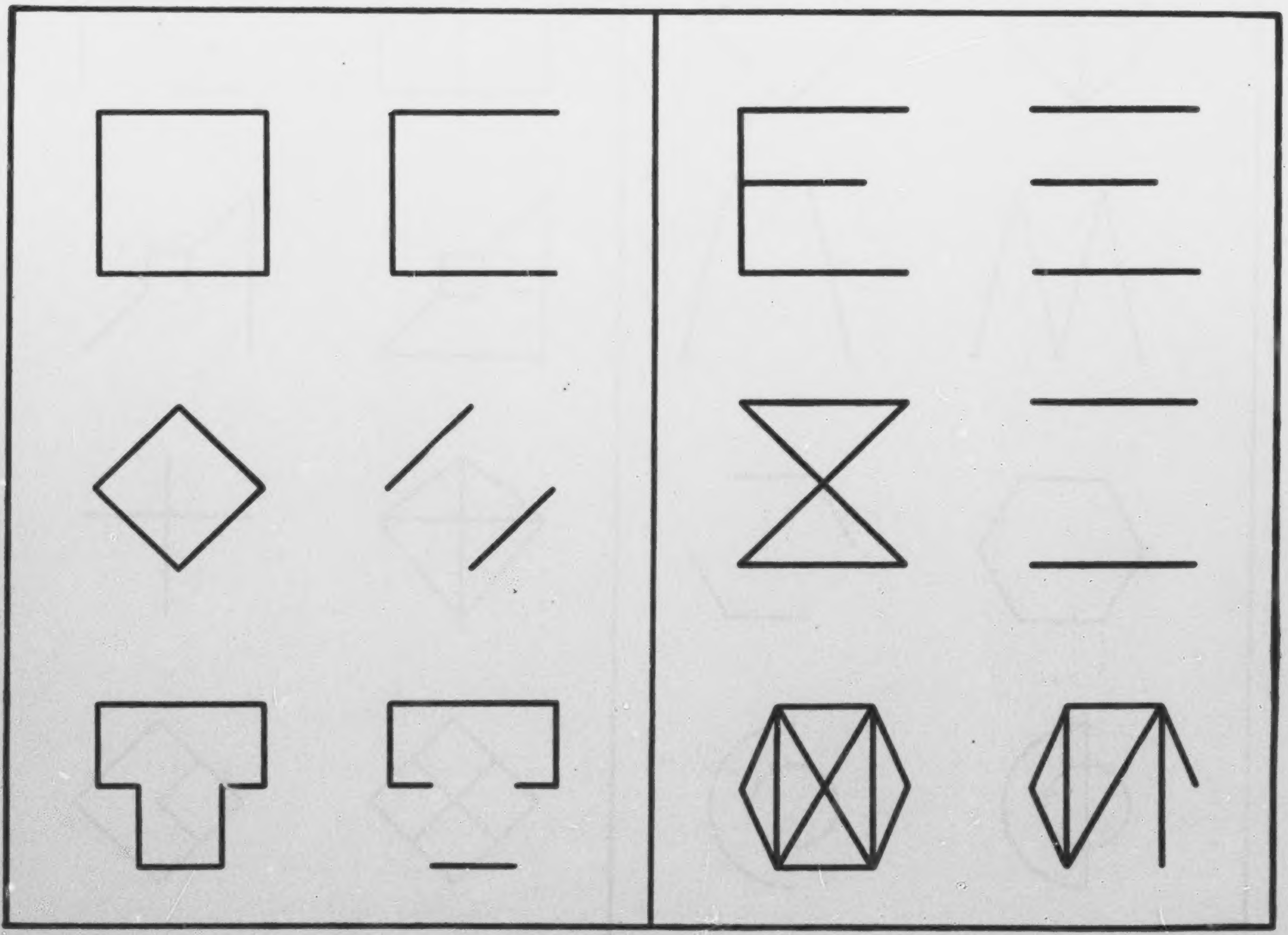
PATTERN COPYING

NAME .... GRADE ....



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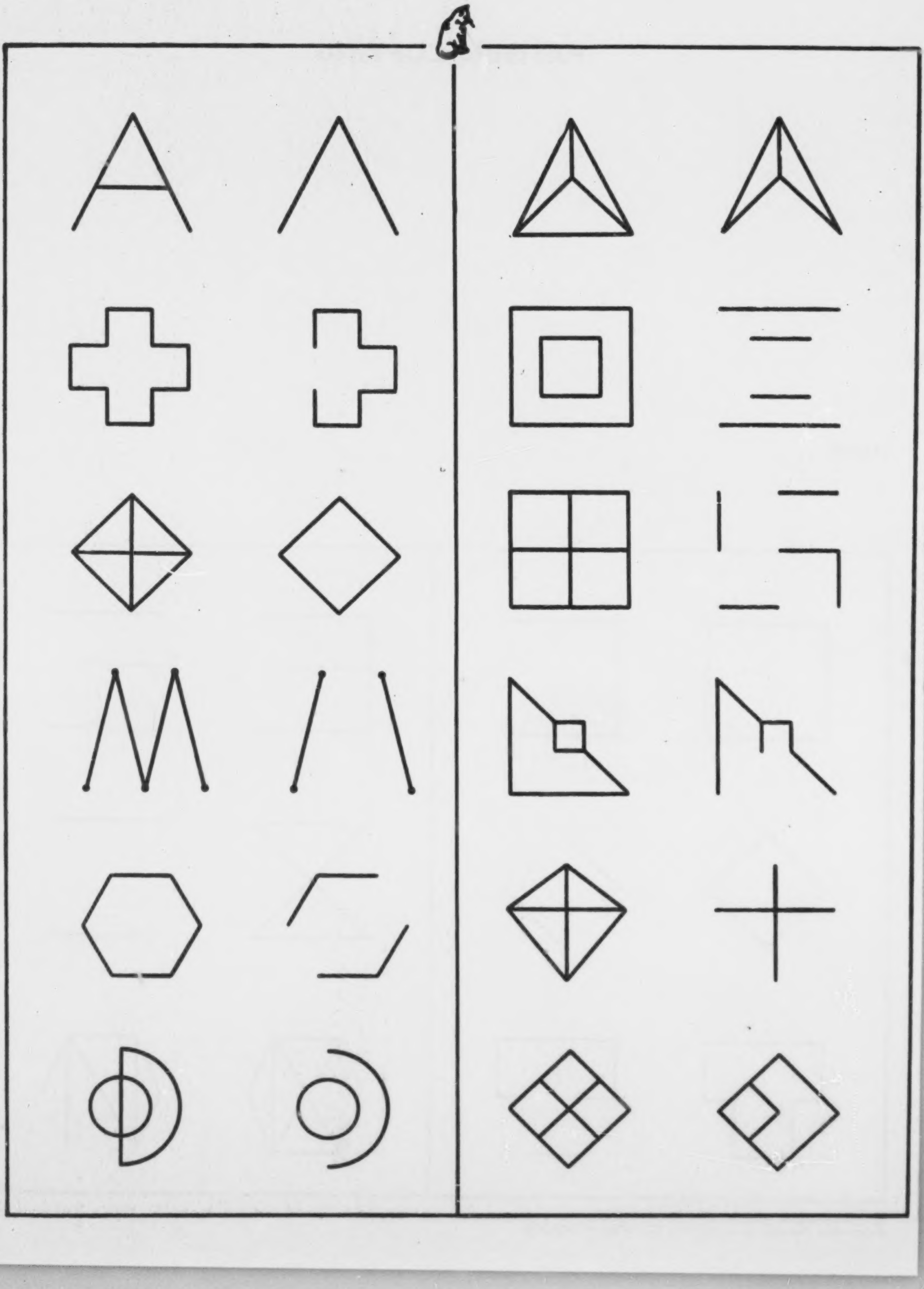

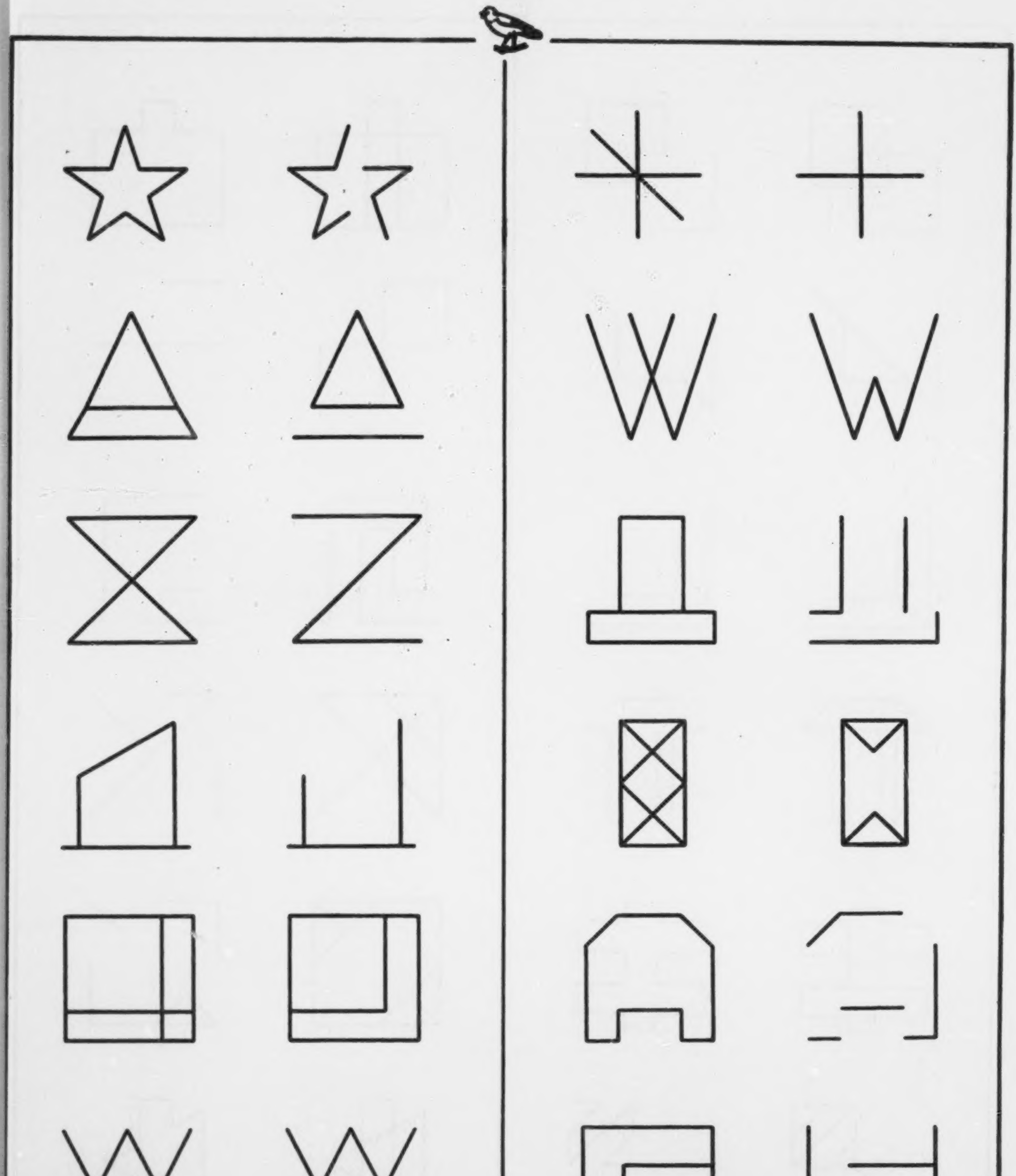

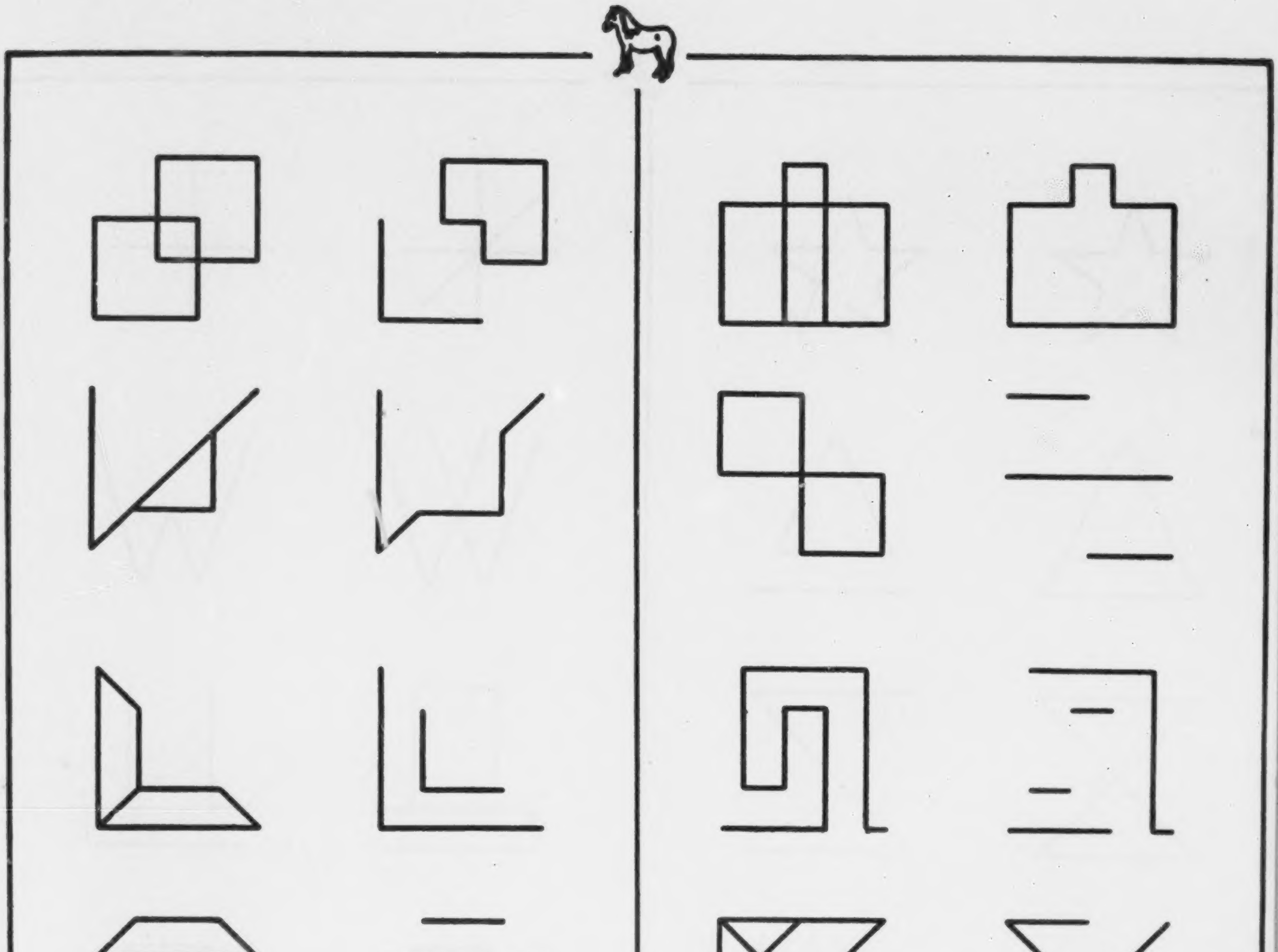

RM
X

Stanford Achievement Test

PRIMARY
I
BATTERY

TRUMAN L. KELLEY · RICHARD MADDEN · ERIC F. GARDNER · HERBERT C. RUDMAN

NAME____
last *first* *initial*

BOY ☐ GIRL ☐ GRADE_____ TEACHER________________________

SCHOOL________________________ DATE OF TESTING____________
year *month* *day*

CITY OR TOWN____________________ DATE OF BIRTH____________
year *month* *day*

STATE________________________ AGE____________
years *months*

	GRADE SCORE	PERCENTILE RANK*	STANINE*								
Word Reading			1	2	3	4	5	6	7	8	9
Paragraph Meaning			1	2	3	4	5	6	7	8	9
Vocabulary			1	2	3	4	5	6	7	8	9
Spelling			1	2	3	4	5	6	7	8	9
Word Study Skills			1	2	3	4	5	6	7	8	9
Arithmetic			1	2	3	4	5	6	7	8	9

*Percentile Ranks and Stanines based on tables for Beginning ☐ Middle ☐ End ☐ of grade (check one)

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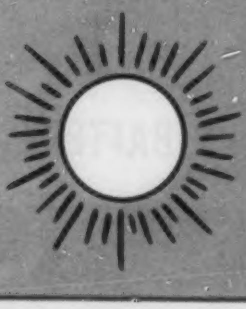
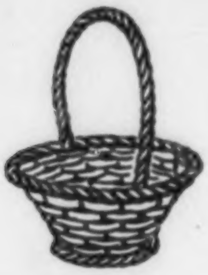
TEST 1: **Word Reading**

SAMPLE



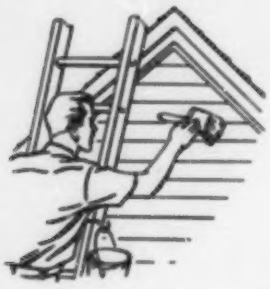
not ○
him ○
sun ☒
sit ○

1



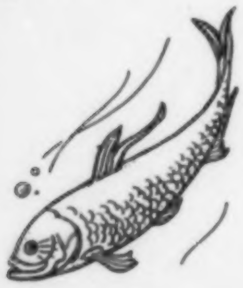
asked ○
last ○
basket ○
lunch ○

2



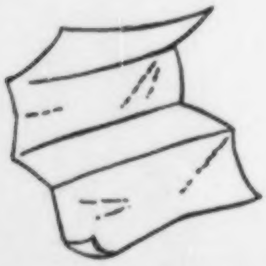
many ○
well ○
how ○
paint ○

3



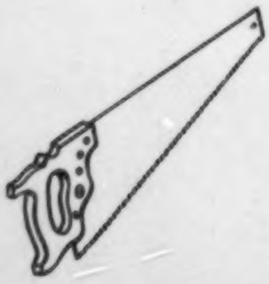
shine ○
fish ○
frog ○
swing ○

4



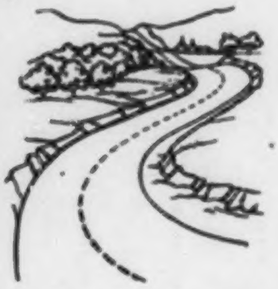
bad ○
sweet ○
paper ○
while ○

5



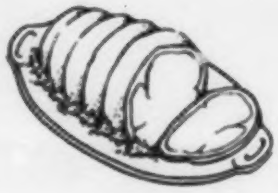
say ○
cup ○
saw ○
song ○

6



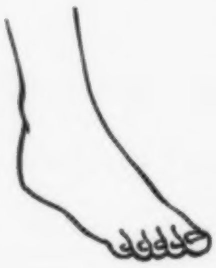
string ○
road ○
farm ○
hide ○

7



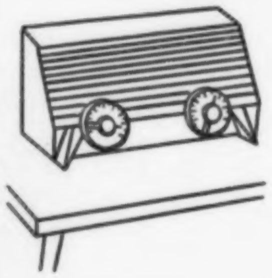
hid ○
near ○
meat ○
straight ○

8



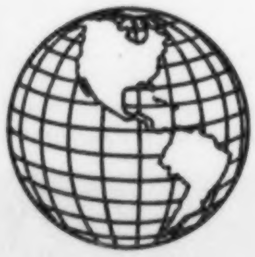
foot ○
large ○
too ○
food ○

9



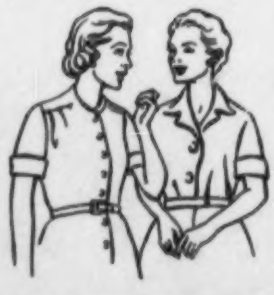
radio ○
stripe ○
riddle ○
broad ○

10



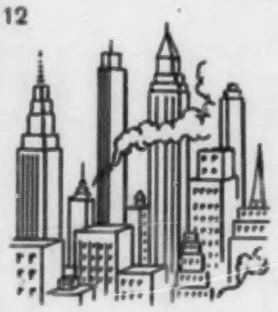
tap ○
move ○
early ○
world ○

11



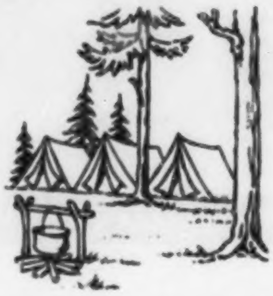
lid ○
leader ○
willow ○
women ○

12



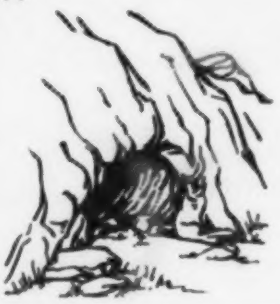
sing
city
told
voice

13



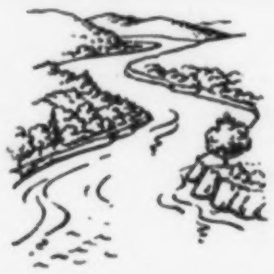
camp
ten
tell
can't

14



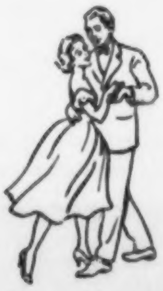
thunder
turtle
cave
turkey

15



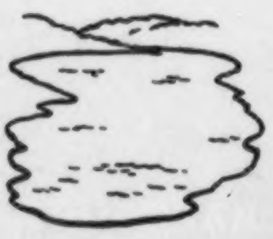
row
root
rake
river

16



dance
danger
dairy
dark

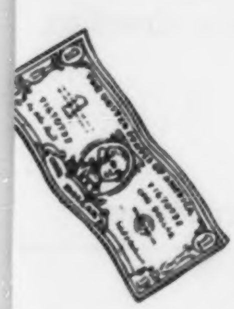
17



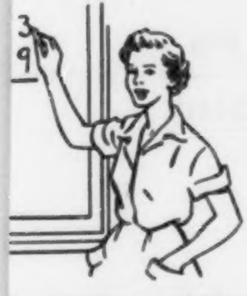
bake
lake
rider
both

GO ON TO THE NEXT PAGE

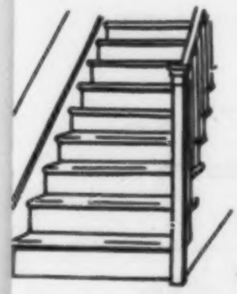
TEST 1: Word Reading (Continued)



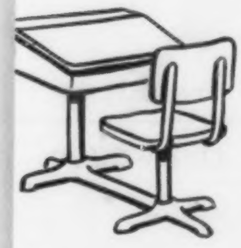
doorway ○
dollar ○
Monday ○
monkey ○



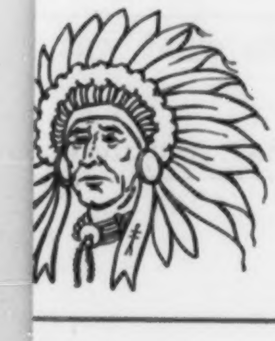
take ○
together ○
teacher ○
teeth ○



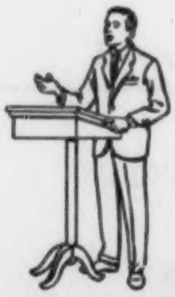
stars ○
doors ○
drove ○
stairs ○



deck ○
desk ○
tale ○
title ○

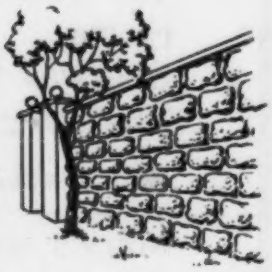


instant ○
breath ○
chief ○
feast ○



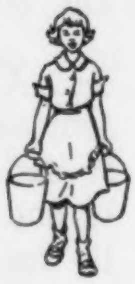
title ○
tease ○
speaker ○
lantern ○

24



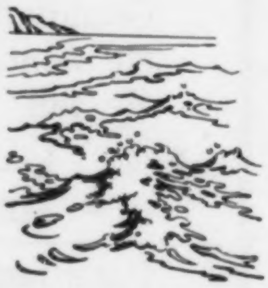
wool ○
wall ○
felt ○
feast ○

25



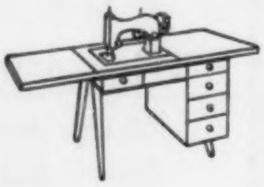
bark ○
grind ○
carry ○
wait ○

26



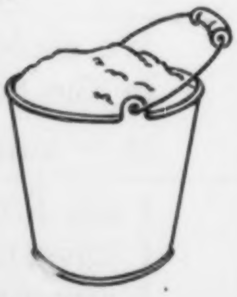
sea ○
supper ○
sure ○
snake ○

27



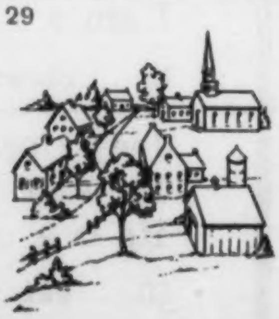
machine ○
firefly ○
messenger ○
family ○

28



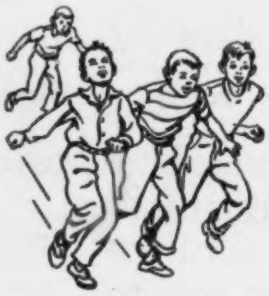
drive ○
glad ○
warmer ○
filled ○

29



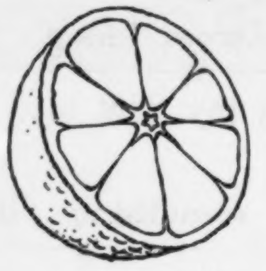
towel ○
valley ○
torn ○
village ○

30



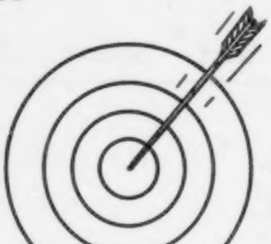
afternoon ○
behind ○
toys ○
bowls ○

31



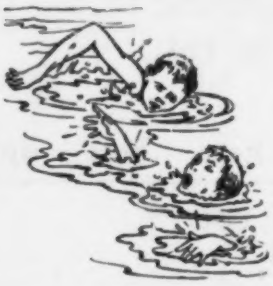
half ○
orchard ○
able ○
harm ○

32



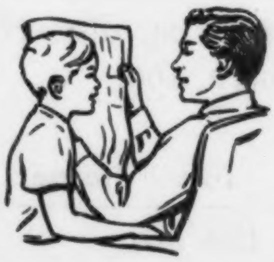
hat ○
tiger ○
hit ○
trying ○

33



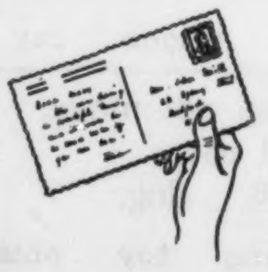
swing ○
weather ○
boards ○
save ○

34



dad ○
dead ○
fireman ○
farther ○

35



ladder ○
card ○
lower ○
listen ○

No. Right	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Gr. Score	Below 10				10	10	11	11	12	13	13	14	14	15	15	16	16	17	17	17	18	18	19	19	20	21	22	23	24	25	26	27	29	32	36

STOP

TEST 2: Paragraph Meaning

SAMPLES
The kitten likes .....A.....

A color mew ~~milk~~ make

The boy wanted to cross the street.
He saw a car coming.
He waited until the .....B..... went by.
Then it was safe to .....C.....

B ~~car~~ people time piece
C look cross skip play

I play with my new toy.
It is a .....1.....

1 ball something little play

See the blue car go.
It can go .....2.....

2 see fast want blue

I am big.
I eat grass.
I give milk.
I am a .....3.....

3 farm cow bottle bug

I have something in my pocket.
It is good to eat.
It is a red .....4.....

4 car hen ball apple

Jane has a pet.
It is a .....5.....

5 baby house pretty kitten

Mother is cooking dinner.
Father is here, too.
We are at .....6.....

6 here fun home school

Billy is in the box.
The box is in the wagon.
Billy is going for a ride in the .....7.....

7 train wagon car airplane

The dog can not move.
He can not eat.
He is a .....8..... dog.

8 running toy noisy jumping

The swimming pool had two dressing rooms.
One was for girls.
The other was for .....9.....

9 ladies girls boys mothers

Mary's ball has two colors.
One side is green.
The other side is .....10.....

10 green round red big

Ann saw something she wanted.
It had a pretty dress.
It had long yellow hair.
It was a .....11.....

11 cowboy girl boy doll

Grandfather went to feed the cows.
He went to the .....12.....
He will .....13..... the horses, too.

12 house barn city town
13 call eat ride feed

Pat's new pet has long hind legs.
It eats lettuce and carrots.
It has long ears.
It is a .....14.....

14 donkey bear pony rabbit

Mary and John played with the wagon.
Mary sat in the wagon.
.....15..... pulled it.

15 John Mary Jane Skip

We could hardly wait to see what was in the box. It was a .....16.....

16 surprise cane parade mailman

I am little.
I have hands.
I sometimes cry.
I am a .....17.....

17 clown calf baby squirrel

Judy's pet has four legs.
He wags his tail when he is happy.
He is a .....18.....

18 cat rabbit duck dog

GO ON TO THE NEXT PAGE

I am red and hot.
I can hurt you.
I am __19__.

19 **water** **fire** **paint** **a tomato**

Dinner is ready.
We must __20__ our hands.

20 **wash** **paint** **hide** **warm**

Our family has three children. Our names are Susan, Walter, and Betty. My name is Betty. My sister's name is __21__.

21 **Lou** **Walter** **Susan** **Betty**

I saw something funny on TV.
It was a __22__.
His nose was big and __23__.

22 **boy** **clown** **girl** **fish**
23 **round** **cold** **old** **sleepy**

The bird made a place for its eggs. It was high up in a tree. It was a __24__.

24 **bird** **cage** **birdhouse** **nest**

Joe ate something sweet and very cold. It felt smooth in his mouth. It was __25__.

25 **candy** **cake** **ice cream** **milk**

I am good to eat.
I am yellow and white inside.
I have a shell outside.
I am an __26__.

26 **apple** **orange** **egg** **onion**

Ann and Jim went to the circus. They bought a bag of peanuts. Jim ate and ate until the bag was nearly empty. "Oh, Jim," said Ann. "Save some __27__ to feed the elephants."

27 **peanuts** **popcorn** **grass** **crumbs**

Peggy went with her mother to the store. They __28__ fruit and meat.

28 **ate** **bought** **sold** **baked**

I am made from wheat. You eat me every day. You cut me and put butter on me. I am __29__.

29 **cake** **candy** **bread** **an egg**

Tom saw some daisies blooming beside the road. He said, "Mother, let me pick those __30__. I want to give them to you."
Mother said, "No, Tom. If you __31__ them, they will soon die. It is better to let them __32__."

30 **flowers** **buds** **leaves** **things**
31 **touch** **pick** **drop** **squeeze**
32 **open** **last** **fade** **live**

Dick went camping.
He took his sleeping bag.
He also took a __33__.

33 **tent** **house** **car** **pony**

One day Sue talked to her grandmother.
Her grandmother lives far away.
Sue was using the __34__.

34 **telephone** **radio** **TV** **newspaper**

Pete is bigger than a mouse.
He is smaller than a dog.
Pete is a __35__.

35 **duck** **house** **mouse** **dog**

Father gave Billy a surprise on his birthday. It was in a long box. The surprise was made of wood. It was a __36__. Billy can play __37__ with it.

36 **ball** **basket** **bat** **bicycle**
37 **basketball** **football** **marbles** **baseball**

Our cat does not like birds.
He will eat them.
We make him wear a __38__.

38 **ribbon** **blanket** **hat** **bell**

STOP

No. Right	1	2	3	4	5	6	7	8	9	10
Gr. Score	10	10	11	11	12	12	13	14	14	15

No. Right	11	12	13	14	15	16	17	18	19	20
Gr. Score	15	15	16	16	16	16	17	17	17	17

No. Right	21	22	23	24	25	26	27	28	29	30
Gr. Score	18	18	18	19	19	20	20	21	22	23

No. Right	31	32	33	34	35	36	37	38
Gr. Score	24	25	26	27	29	31	36	40

TEST 3: **Vocabulary**

SAMPLE
lamp ○
chair ○
bread ☒

1
learn ○
sing ○
travel ○

2
wall ○
street ○
tree ○

3
the oven ○
water ○
fat ○

4
attempt ○
command ○
shine ○

5
university ○
prison ○
library ○

6
slender ○
bushy ○
slanting ○

7
music ○
cloth ○
wood ○

8
move fast ○
stand up ○
go places ○

9
floats ○
dives ○
swims ○

10
church ○
hotel ○
store ○

11
night ○
winter ○
sunshine ○

12
excited ○
sorry ○
satisfied ○

13
bright ○
strange ○
old ○

14
come ○
follow ○
begin ○

15
finish ○
guard ○
play ○

16
test ○
chart ○
check ○

17
least ○
worst ○
most ○

18
works ○
learns ○
buys ○

19
list ○
burden ○
crowd ○

20
disappear ○
worry ○
paint ○

21
supply ○
find ○
study ○

22
shrub ○
stem ○
vine ○

23
sunset ○
stars ○
distance ○

24
metal ○
silver ○
gold ○

25
poor ○
average ○
public ○

26
history ○
speech ○
people ○

27
mild ○
damp ○
cold ○

28
dance ○
crown ○
meal ○

29
fares ○
freight ○
passengers ○

30
light ○
thick ○
quick ○

31
win ○
pardon ○
desire ○

32
bad
unsuccessful
dull

33
eager
able
active

34
bottle
container
box

35
sells it
makes it
rents it

36
appointed
prevented
disturbed

37
water
earth
toys

38
lost
afraid
apart

39
friends
pals
acquainted

No. Right	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Gr. Score	Below 10		10	10	10	11	11	11	12	12	13	13	14	14	15	15	16	17	18	19

No. Right	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Gr. Score	20	21	22	23	24	25	26	27	29	31	33	36	40	44	48	52	55+		

ST

TEST 4: Spelling

1 ______________________

2 ______________________

3 ______________________

4 ______________________

5 ______________________

6 ______________________

7 ______________________

8 ______________________

9 ______________________

10 ______________________

11 ______________________

12 ______________________

13 ______________________

14 ______________________

15 ______________________

16 ______________________

17 ______________________

18 ______________________

19 ______________________

20 ______________________

No. Right	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Gr. Score	10	11	12	13	14	15	16	16	17	17	18	19	20	21	22	23	24	26	30	34

STOP

TEST 5: Word Study Skills

SAMPLES

A
busy ○
song ☒
warm ○

B
toy ○
boy ○
day ○

1
climb ○
apple ○
letter ○

2
who ○
two ○
work ○

3
well ○
tell ○
help ○

4
short ○
wish ○
stop ○

5
take ○
time ○
tree ○

6
give ○
gave ○
gray ○

7
never ○
answer ○
only ○

8
found ○
wait ○
away ○

9
thing ○
try ○
took ○

10
very ○
voice ○
phone ○

11
wrong ○
seed ○
need ○

12
knock ○
call ○
time ○

13
open ○
one ○
other ○

14
easy ○
egg ○
early ○

SAMPLES

C
snake ☒
joke ○
luck ○

D
big ○
boy ○
play ○

15
mad ○
mud ○
made ○

16
rose ○
rooster ○
roast ○

17
touch ○
toe ○
town ○

18
spool ○
spell ○
steel ○

19
nut ○
neck ○
dark ○

20
might ○
perhaps ○
please ○

21
why ○
toy ○
cry ○

22
crumb ○
soon ○
jump ○

23
thank ○
thick ○
drink ○

24
seen ○
three ○
sleep ○

25
think ○
bring ○
bright ○

26
dish ○
wash ○
which ○

27
aid ○
train ○
tried ○

28
beg ○
bad ○
said ○

GO ON TO THE NEXT PAGE ▶

SAMPLES

E
far ○
car ⊗
tar ○

F
say ○
day ○
play ○

29
peek ○
seek ○
week ○

30
then ○
ten ○
hen ○

31
beside ○
inside ○
upside ○

32
put ○
but ○
cut ○

33
rake ○
bake ○
lake ○

34
fold ○
cold ○
hold ○

35
and ○
end ○
sand ○

36
jet ○
get ○
yet ○

37
where ○
here ○
were ○

38
sip ○
chip ○
ship ○

39
know ○
cow ○
now ○

40
till ○
still ○
sill ○

41
read ○
tread ○
thread ○

42
sit ○
knit ○
kit ○

SAMPLES

G
hate ⊗
hat ○
hot ○

H
ride ○
rid ○
said ○

43
stand ○
stop ○
stood ○

44
nest ○
near ○
neat ○

45
sat ○
sad ○
said ○

46
ton ○
town ○
torn ○

47
fury ○
few ○
funny ○

48
sing ○
song ○
sink ○

49
guess ○
have ○
calf ○

50
bank ○
back ○
bake ○

51
pen ○
pin ○
pan ○

52
because ○
before ○
below ○

53
late ○
light ○
life ○

54
redder ○
reader ○
rider ○

55
best ○
guess ○
chairs ○

56
hurt ○
hard ○
heard ○

ight	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
core	Below										10	10	10	10	11	11	11	12	12	12	12	13	13	13	14

ight	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
core	14	14	15	15	15	16	16	17	18	18	19	19	20	20	21	22	23	24	25	26	27	28	30	32	34

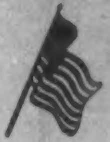
ight (cont'd)	51 52 53 54 55 56
core	39 48 55+

STOP

TEST 6: **Arithmetic** *Part A: Measures*

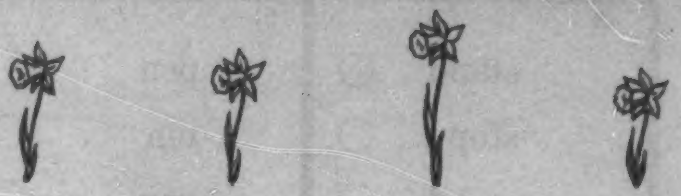
SAMPLES

A



1 ~~2~~ 3 4

B



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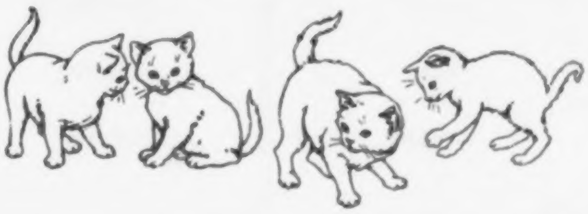

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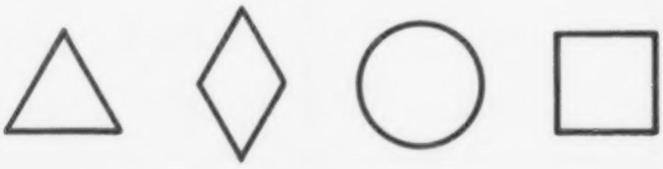

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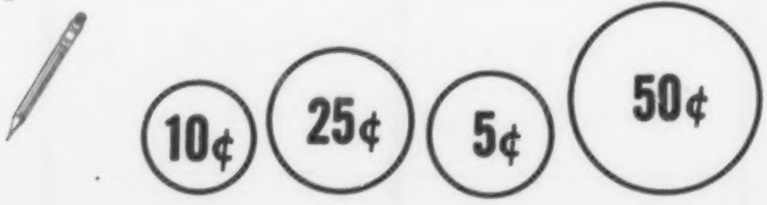

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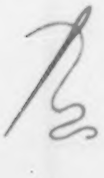
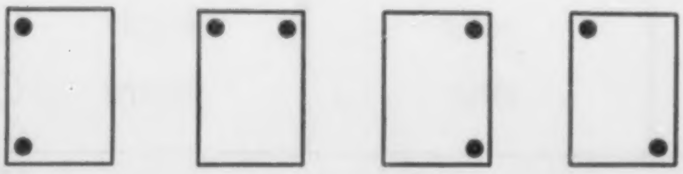


12 30 52 60

5



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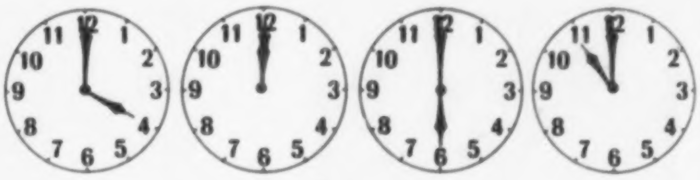

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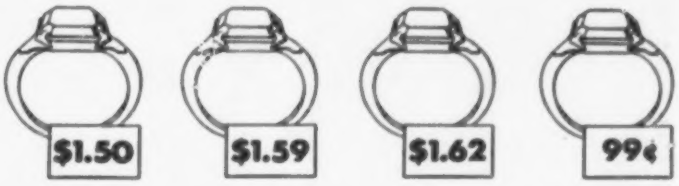
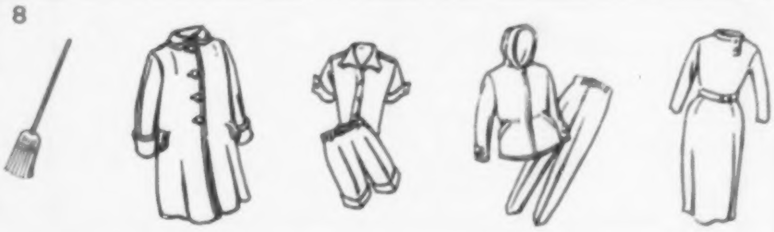

$1.50
$1.59
$1.62
99¢

8



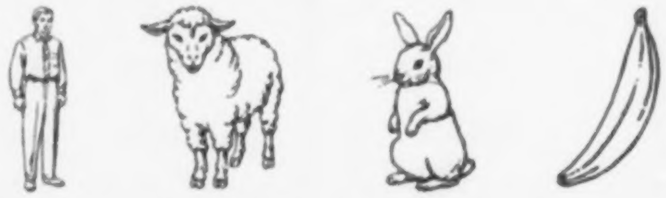
9

DECEMBER

Sun.	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12

4 5 6 1

10



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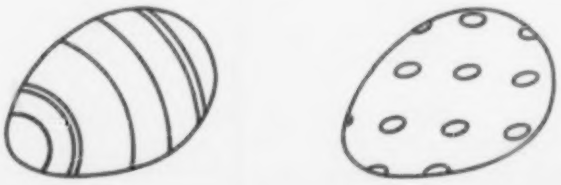

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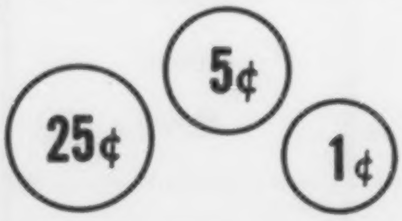
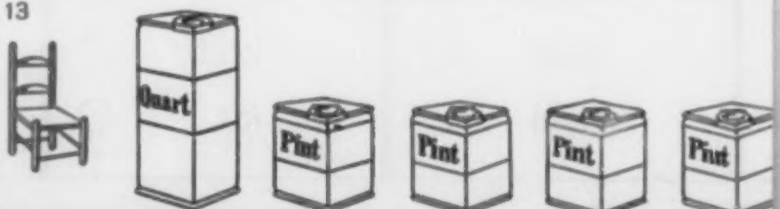


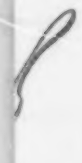
26¢ 30¢

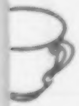
31¢ 36¢

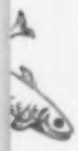
13


Quart
Pint
Pint
Pint
Pint

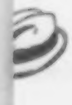
GO ON TO THE NEXT PAGE

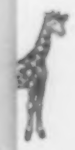
 2 4 6 8

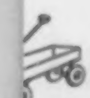
 2 3 4 5

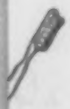
 1 3 5 6

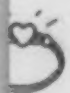
2 3 5 6

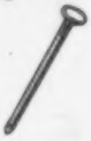
 1 4 5 6

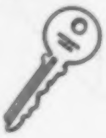
 1 3 5 6

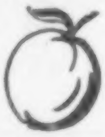
 6 7 15 51

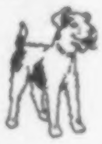
 5 6 7 8

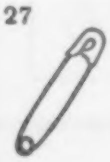
 20 22 40 60

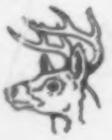
23  1 2 3 4

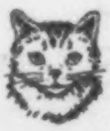
24  1 2 3 4

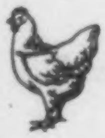
25  5 6 7 8

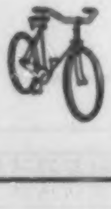
26  1 2 3 10

27  1 2 3 4

28  1 4 5 10

29  3 6 8 9

30  1 2 3 4

31  1 3 7 10

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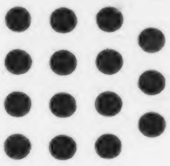
TEST 6: Arithmetic (Continued) *Part C: Number Concepts*

32



. ______

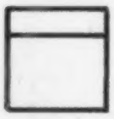
33

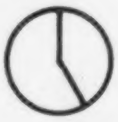
9 1

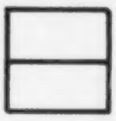
seven

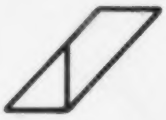
7 6

34









35

43 27 18 39

36

6 10 12 16

37

	10	12	14	16

38

______

39

159 ☐

40

15		13	12

41

109		111

42

11 38 83 80

43

4 14 40 40

44

2
+7

45

6
+3

46

7
+4

47

4
1
+3

48

3
2
+4

49

5
3
+3

50

5
−0

51

6
−4

52

9
−8

53

10
−4

54

7
−4

55

10
−8

56

6 + 4 = ☐

57

3 + ☐ = 5

58

3 + ☐ = 7

59

☐ + 3 = 10

60

5 − 1 = ☐

61

9 − 4 = ☐

62

6 − ☐ = 1

63

☐ − 2 = 2

No. Right	1	2	3	4	5	6	7	8	9	10
Gr. Score	Below 10				10	10	10	11	11	11

No. Right	11	12	13	14	15	16	17	18	19	20
Gr. Score	11	12	12	12	12	13	13	13	14	14

No. Right	21	22	23	24	25	26	27	28	29	30
Gr. Score	14	14	15	15	15	15	16	16	16	16

No. Right	31	32	33	34	35	36	37	38	39	40
Gr. Score	16	17	17	17	17	18	18	18	19	19

No. Right	41	42	43	44	45	46	47	48	49	50
Gr. Score	19	20	20	21	21	22	22	23	23	24

No. Right (cont'd)	51	52	53	54	55	56	57	58	59	60	61	62	63
Gr. Score	24	25	25	26	26	27	28	29	31	33	38	43	55

ST

1

AN INVENTORY OF READING ATTITUDE

(Standardization Edition)

Name ______________________________ Grade ________ Boy Girl
Last First Middle

School ______________________ Teacher ______________________

Date of Test ______________________
Mo. Day Yr.

TO BOYS AND GIRLS:

This sheet has some questions about reading which can be answered YES or NO. Your answers will show what you usually think about reading. After each question is read to you, circle your answer.

INSTRUCTIONS TO PUPILS

Draw a circle around the word YES or NO, whichever shows your answer.

Sample A

Yes No Do you like to read?

If you like to read, you should have drawn a circle around the word YES in Sample A; if you do not like to read, you should have drawn a circle around the word NO.

Sample B

Yes No Do you read as well as you would like to?

If you read as well as you would like to, you should have drawn a circle around the word YES in Sample B; if not, you should have drawn a circle around the word NO.

Yes No 1. Do you like to read before you go to bed?

Yes No 2. Do you think that you are a poor reader?

Yes No 3. Are you interested in what other people read?

Yes No 4. Do you like to read when your mother and dad are reading?

Yes No 5. Is reading your favorite subject at school?

Yes No 6. If you could do anything you wanted to do, would reading be one of the things you would choose to do?

Yes No 7. Do you think that you are a good reader for your age?

Yes No 8. Do you like to read catalogues?

Yes No 9. Do you think that most things are more fun than reading?

Yes No 10. Do you like to read aloud for other children at school?

Yes No 11. Do you think reading recipes is fun?

Yes No 12. Do you like to tell stories?

Yes No 13. Do you like to read the newspaper?

Yes No 14. Do you like to read all kinds of books at school?

Yes No 15. Do you like to answer questions about things you have read?

Yes No 16. Do you think it is a waste of time to make rhymes with words?

Yes No 17. Do you like to talk about books you have read?

Yes No 18. Does reading make you feel good?

Yes No 19. Do you feel that reading time is the best part of the school day?

Yes No 20. Do you find it hard to write about what you have read?

Yes No 21. Would you like to have more books to read?

Yes No 22. Do you like to read hard books?

Yes No 23 Do you think that there are many beautiful words in poems?

Yes No 24. Do you like to act out stories that you have read in books?

Yes No 25. Do you like to take reading tests?

Supt. of Schools, Dept. of Educ.
San Diego County 2-61

Gilmore Oral Reading Test

FORM A

by John V. Gilmore

Associate Professor of Psychology
Boston University

RECORD BLANK

NAME____________________ DATE____________________ GRADE__________

SCHOOL____________________ AGE________ YEARS ________ MONTHS SEX__________

CITY____________________ STATE____________________ EXAMINER__________

Summary Check List of Difficulties

From an analysis of the pupil's oral reading performance, complete the check list below.

____ Many substitutions
____ Habitual mispronunciations
____ Many words pronounced by examiner
____ Habitual disregard of punctuation
____ Habitual insertions
____ Habitual hesitations
____ Habitual repetitions
____ Habitual omissions
____
____
____
____

Check the following immediately after completion of the testing:

____ Word-by-word reading
____ Reads in monotone
____ Strained, high-pitched voice
____ Volume too loud
____ Volume too soft
____ Poor enunciation

Comments:____________________

____

____

____

____

Test Summary

PARAGRAPH	ACCURACY		COMPREHENSION	RATE	
	ERRORS	10 MINUS NO. ERRORS	NO. RIGHT (OR CREDITED)	WORDS IN ¶	TIME IN SEC.
1				26	
2				50	
3				51	
4				68	
5				107	
6				107	
7				126	
8				147	
9				184	
10				252	
	ACC. SCORE (TOT. "10 MINUS NO. ERRORS" COLUMN)		COMP. SCORE (TOT. NO. RIGHT OR CREDITED)	(1) NO. WORDS READ*	
				(2) TIME IN SEC.*	
				(1) ÷ (2)	×60
GRADE EQUIV.				RATE SCORE (WPM)	
RATING					

*Do *not* count "ceiling" paragraph or paragraphs below "basal."

Silent Reading Test Data DATE__________

TEST____________________

WORD MEAN. (VOCAB.) GRADE EQUIV.__________

PARA. MEAN. (READ.) GRADE EQUIV.__________

AVE. READ. GRADE EQUIV.__________

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PRINTED IN U.S.A. G:ORT:RB:A-14

1. I see a boy.
He has a dog.
Here is a girl.
I see a cat, too.
The man is Father.
Mother is in the house.

TIME ____Seconds

___1. What animal is the boy playing with?
___2. What other animal is there?
___3. Who is the man?
___4. Where is Mother?
___5. Whom else do you see?

NUMBER RIGHT ____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

2. The girl is in the yard.
The girl has a big ball.
The boy is back of the girl.
He is playing with his dog.
The cat looks at the girl.
He wants to play ball, too.
The girl does not see the cat.
She is looking at the ball.

TIME ____Seconds

___1. Where is the girl?
___2. What does the girl have?
___3. What is the boy doing?
___4. What does the cat want?
___5. What is the girl looking at?

NUMBER RIGHT ____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

---

5. Every morning Father goes to his office by train. He usually leaves the house about eight o'clock. In rainy weather Mother drives him to the station. When the train reaches the city at eight forty-five, Father goes to the general offices of his company. An elevator carries him to the eleventh floor. His important position takes hours of extra time, and many evenings he doesn't arrive home until late. Bob and Jane are disappointed when he works at night, for he frequently assists them with their lessons. Then, too, if there is time after dinner for games, he often plays with them before they begin to study.

TIME ____Seconds

___1. What time does Father leave the house in the morning?
___2. What does Mother do for Father when it is raining?
___3. On what floor is Father's office?
___4. How does Father help Bob and Jane when he is home evenings?
___5. When does Father play games with them?

NUMBER RIGHT ____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

6. Nearly every family living in the city suburbs takes a vacation sometime during the summer. When the weather becomes warm, usually during July, Bob and Jane accompany their parents to the seaside. In order to reach their destination on the shore, they are obliged to travel over a mountain range. If they begin their journey before sunrise the first day, they can see many impressive scenes in the mountains. The exciting but lengthy trip requires two full days. While at the beach Bob and Jane spend many blissful hours bathing in the surf and relaxing on the sunny sand. Summer vacations help Bob and Jane keep healthy.

TIME ____Seconds

___1. What does almost every city family do in summer?
___2. What month do Bob and Jane usually go to the seashore with their parents?
___3. What must they do to reach the shore?
___4. How long is their trip?
___5. How do summer vacations help Bob and Jane?

NUMBER RIGHT ____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

3. The name of the boy is Bob.
The name of his sister is Jane.
They live with their parents
in a white house near the city.
They are playing on the walk.
The dog and cat are their pets.
After Father has gone to work,
the children will leave for school.

TIME ______Seconds

___1. What is the boy's name?
___2. What is his sister's name?
___3. Where is their house?
___4. What are their pets?
___5. When will the children leave for school?

NUMBER RIGHT ______

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

4. Mother waves good-by to Father each morning. She begins the housework soon after he leaves. Bob and Jane help her before they go to school. They dry the dishes and clean their own rooms. After Mother has finished the work indoors, she goes out to her pretty flower garden. She tends it nearly every day for about an hour. Mother does all her work with great care.

TIME ______Seconds

___1. What does Mother do as Father is leaving?
___2. What does Mother do after Father has gone?
___3. When do Bob and Jane help Mother?
___4. Where does Mother go after she has finished the work indoors?
___5. How long does she work in her garden each day?

NUMBER RIGHT ______

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

7. After their restful and refreshing vacation is over, Bob and Jane feel quite adequately prepared for school. When they return from their sojourn at the seashore, they are overjoyed to play with their pets once again. Their parents are delighted to see them tanned and healthy. School opens within a few weeks after they return home, and during August their mother helps them acquire the new clothing and equipment which they will need later. Each year the beginning of school in early September brings a stimulating program of very challenging studies. Bob's favorite subject will undoubtedly be sixth-grade science, while Jane, entering the fourth grade, will enjoy reading. In addition to schoolwork, both will take music lessons. Jane studies the violin, but Bob prefers the trumpet.

TIME ______Seconds

___1. What do Bob and Jane play with when they return from their vacation?
___2. In what month does their mother help them buy their clothing and school equipment?
___3. What grade will Bob be in?
___4. What subject will Jane like?
___5. What musical instrument does Bob play?

NUMBER RIGHT ______

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

8. Mother and Father are proudly making ambitious plans for the future education of their children, Bob and Jane. They realize that several factors are going to play a part in the ultimate selection of their careers. First of all, the children must be physically and mentally equipped for the professions of their choice. The financial cost of the necessary training program must also be considered, while a third factor is the attitude of relatives and friends. Obviously, Bob and Jane are not yet able to make a final choice. Parents often entertain secret ambitions for their children, and Mother and Father hope that Bob and Jane will enter some branch of medicine. They visualize Bob in surgery; however, at present he is fascinated by aviation. Although Jane has always aspired to be a kindergarten teacher, her family thinks that she is ideally suited for the nursing profession.

TIME ______Seconds

___1. What are Mother and Father planning for?
___2. What profession do they hope Bob and Jane will choose?
___3. What branch of this profession would they like Bob to enter?
___4. What interests Bob at the present time?
___5. What has Jane always wanted to be?

NUMBER RIGHT ______

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

9. Although Bob and Jane now think they will eventually comply with their parents' wishes in choosing medicine as their profession, a recent school incident indicates that their interests may later turn more in the direction of an intensive study of the human mind. One day, while discussing with their science instructor the differences between human beings and animals, they discovered that human mentality differs chiefly from animal mentality in being essentially preoccupied with symbols. They realized, for the first time, that they themselves were employing symbols. They learned that a symbol is a sign or word which refers to something, such as an object, a person, or a concept, and that nearly all knowledge is a product of symbolic expression. They discovered that symbols are used in languages, mathematics, and music; and they learned that even the flag is a symbolic emblem of patriotism. Thus, Bob and Jane are beginning to realize that the mind of man, which deals pre-eminently with these symbols, is a significant study in itself. They recognize the truth inherent in the adage, "The proper study of mankind is man."

TIME _____Seconds

__1. What study may later become of absorbing interest to Bob and Jane?
__2. With whom were Bob and Jane talking when they were comparing human beings and animals?
__3. How does the human mind differ from that of an animal?
__4. What emblem signifies love of country?
__5. What is the saying of which Bob and Jane now recognize the truth?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

10. When Bob and Jane study psychology in college, they will further penetrate the intricacies of the human mind. Learning that the mind and the emotions are closely interrelated, they will discover that virtually all problems which cause disturbance to an individual are associated in some degree with his emotional life. A person's "emotional adjustment" not only affects his own happiness and equilibrium, but also has a profound influence on his associates; thus it is axiomatic that emotions are a fundamental consideration in all human relationships. Psychology has proved conclusively that harmony or discord among persons, far from occurring fortuitously, can be explained by the same principle of cause and effect which operates in other fields of science. There appear to be two general causes of group tensions: the first is genetic in character; and the second, related to the cultural milieu in which we live. Scholars in various areas of study, among whom we find anthropologists, sociologists, and statisticians, have joined the psychologist in assiduous investigations in this complex field. The problems of human relations which confront our present-day society are both baffling and challenging; as intelligent citizens we can and should contribute to their ultimate solution by trying conscientiously to understand our own behavior. Such injunctions as "Don't take yourself too seriously" have in the past been fashionable attempts at disposing of personal problems. However, they are little more than avoidance mechanisms which ignore the real causes of behavior; in light of current psychology they may in fact be considered anachronistic.

TIME _____Seconds

__1. In what college course will Bob and Jane study about the mind?
__2. What factor affects the happiness of every individual?
__3. According to modern psychology, what scientific principle explains relationships among people?
__4. Name one field besides psychology in which scholars are studying the problems of human relations.
__5. What can each individual do to help in the solution of these problems?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

PHONETICALLY REGULAR WORDS ORAL READING TEST

Child's Name ____________________ Date ____________________

School ____________________ Room ________ Code Number ________

Examiner ____________________ Number of words read correctly ________

1. nap
2. pen
3. hid
4. job
5. rug
6. shade
7. drive
8. joke
9. mule
10. plain
11. hay
12. keen
13. least
14. loan
15. show
16. walk
17. haul
18. jaw
19. soil
20. joy
21. frown
22. trout
23. term
24. curl
25. birch
26. rare
27. star
28. porch
29. smooth
30. shook

Directions: Have pupil read words from one copy while examiner makes another copy. Do not give pupil a second chance but accept immediate self-correction. Let every student try the whole first column. If he gets two words correct from word number six on, let him try the whole second column.

GATES WORD PRONUNCIATION TEST

EXAMINER'S COPY

DIRECTIONS: Have the child read the words out loud. Tell him you would like him to read some words for you. If he fails the first time, ask him to try the word again. Continue until ten consecutive words have been missed. As the words become difficult, special care should be taken to encourage the child. The score is one point for each word correctly pronounced on the first trial, one-half point for each word correctly pronounced on the second trial. (Note: 9½ correct would be scored as 10.)

---

1. so
2. we
3. as
4. go
5. the
6. not
7. how
8. may
9. king
10. here
11. grow
12. late
13. every
14. about
15. paper
16. blind
17. window
18. family
19. perhaps
20. plaster
21. passenger
22. wander
23. interest
24. chocolate
25. dispute
26. portion
27. conductor
28. brightness
29. intelligent
30. construct
31. position
32. profitable
33. irregular
34. schoolmaster
35. lamentation
36. community
37. satisfactory
38. illustrious
39. superstition
40. affectionate

Child's name: ______________________ Test date ____ ____ ____

Examiner: ______________________ Birth date ____ ____ ____

Age: ________

APPENDIX D

Instructions for Eliciting Writing Samples and Description of Correction Procedures Used

DIRECTIONS FOR ELICITING
WRITING SAMPLES

First Grade Written Language Measures
USOE Cooperative Research Project

Directions to the Classroom Teacher

General Information

You are being asked to obtain two writing samples from each pupil in your classroom. We wish to emphasize the necessity of following the directions and procedures exactly.

As you realize, many other teachers throughout the nation will be asked to obtain writing samples from their pupils. It is necessary, therefore, that these samples be obtained in all classrooms at approximately the same time and by following the same directions.

You are requested to obtain the first writing sample (Restricted Stimulus Measure) on May 19 (morning).
(Project Director Specifies Date)

The second writing sample (Unique Stimulus Measure) should be obtained on May 20 (morning).
(Project Director Specifies Date)

DIRECTIONS -- RESTRICTED STIMULUS MEASURE

Classroom Situation

No attempt should be made to enrich your normal room display through the use of word lists, pictures, dictionaries, etc. The classroom conditions should approximate those normally found in your daily writing activities.

Materials

The writing paper and pencils customarily used in your classroom should be used in obtaining this sample.

Identification

The pupil's name, teacher's name, and the school should be indicated on each pupil's paper. In some cases, you might initial the back of each paper, or a code number may be assigned by your Project Director.

Teacher Directions to the Pupils

Children are to be asked simply to "write a story." You are requested to spend a minimum amount of time motivating the class to write a story. This motivation should consist of:

1. General encouragement to the whole class that you are interested in reading their stories and that they are to use their very best handwriting.
2. Additional encouragement to individual pupils by such directions as:

> "I'm sure you have an interesting story you would like to write for me today, Billy."
>
> "Sally, I'll bet you have a really good story you would like to write for me."
>
> "I liked that story you wrote for me last week, Mary. I'm sure you could write another one for me. Let's try."

This additional motivation should be of a general type and should be directed toward getting the pupils to write rather than in providing them with specific ideas.

It is particularly cautioned that no specific titles be presented, nor should pictures or other stimuli be employed.

Other Procedures

No spelling help should be provided during the writing period.

If pupils request spelling assistance, they should be told to try to spell the word and then be encouraged to proceed.

If pupils normally use a simplified dictionary or write from displayed flashcards or use a speller, such practices may be allowed.

Under no circumstances, however, should you correct misspellings, give ideas, or assist the pupil beyond the point of general encouragement.

Time Limit

Following the heading of the paper, twenty minutes should be allowed for the pupils to finish their stories. Papers of pupils who finish early should be inconspicuously collected and a coloring exercise or similar silent activity should be provided for the remainder of the twenty minutes.

Written Sample Identification

At the end of twenty minutes, all stories should be collected, packaged, and clearly labeled:

RESTRICTED STIMULUS SAMPLES (Date ____________________)

You are not to correct these stories; they will be corrected and scored by the Project Director's Staff who will apprise you of the correction procedures should you desire this information.

CORRECTION PROCEDURES

MECHANICS RATIO SCALE:

It is suggested that the papers be corrected by three staff members. Corrections should be made for:

Capitalization - Red (ball point) circles should be drawn around all possible capitalizations.

- If the pupil has capitalized correctly, a red diagonal line should be drawn through the circle.

- The mechanics-ratio score for capitalization will be the number correct over the number possible.
- Score: 1 point for each correct capital in the title.

  1 point for each correct capital at the beginning of a sentence.

  1 point for each correct capitalization of a proper name.

  1 point for each correct capitalization of a day or month.

  1 point for each correctly capitalized "I."

Punctuation

- Blue (ball point) circles should be drawn around all possible punctuations.
- If the pupil has punctuated correctly, a blue diagonal line should be drawn through the circle.
- The mechanics-ratio score for punctuation will be the number correct over the number possible.
- Score: *1 point for each correct (.) period.*

  1 point for each correct (?) question mark.

  1 point for each correct (!) exclamation mark.

  1 point for each correct (" ") set of quotation marks.

  1 point for each correct (,) comma in a direct quote.

Indentations

- Green (ball point) circles should be drawn around the first word of all possible indentations.
- If the pupil has indented correctly, a green diagonal line should be drawn through the circle.
- Score: 1 point for each correctly indented paragraph.

TOTAL MECHANICS-RATIO SCORE

The total mechanics-ratio score should be recorded as per cent: (6/12 = 50%, 25/32 = 70%). The obtained per cent of mechanics accuracy should be recorded on Card 2 in the columns which will be specified by the Coordinating Center.

Spelling

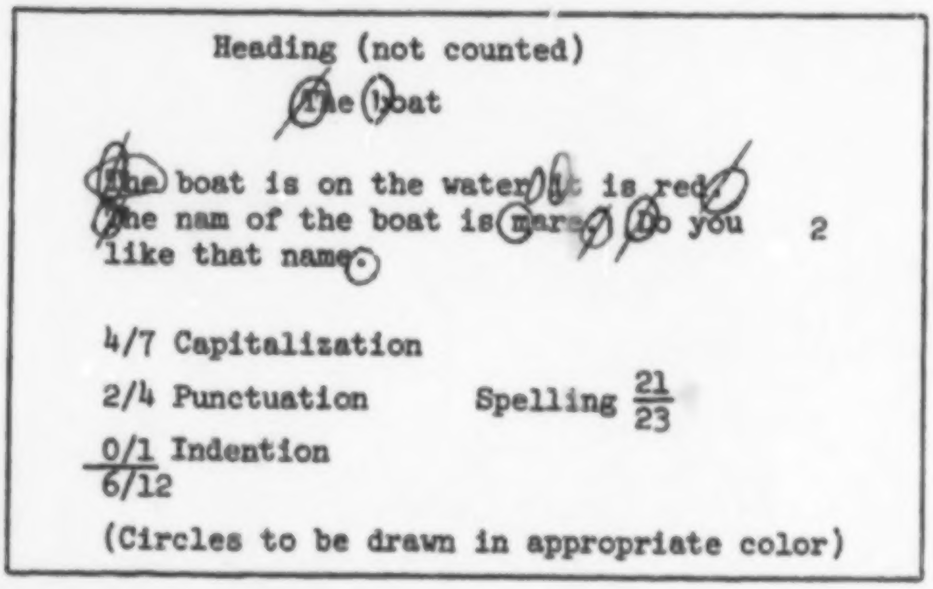
- Tally the number of spelling errors to the right of each line.
- A word incorrectly capitalized should be recorded as a spelling error.
- Subtract the number of errors from the total number of running words.
- Score as number of words spelled correctly over total number of running words.

TOTAL SPELLING-RUNNING WORD COUNT

The total number of words correctly spelled should be recorded on Card 2 in those columns which will be specified by the Coordinating Center.

The total number of running words should be recorded on Card 2 in those columns which will be specified by the Coordinating Center.

Sample:



Heading (not counted)

the boat

the boat is on the water it is red
the nam of the boat is mare do you 2
like that name.

4/7 Capitalization
2/4 Punctuation Spelling $\frac{21}{23}$
0/1 Indention
6/12

(Circles to be drawn in appropriate color)